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OM protein - protein search, using SW model

Run on: February 14, 2005, 14:48:56 ; search time 172 Seconds

Perfect score: 3406 (without alignments)  
Sequence: 1 MNPNNRSEHDTIKVTPNSBL.....SFVSNKEIYIDKIBFIPVQL 652

Title: US-10-614-076-98

Scoring table: BLOSUM62  
Gapop 10.0 , Gapext 0.5

Searched: 2105692 seqs, 386760381 residues

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0

Maximum DB seq length: 20000000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 150 summaries

Database : A\_GenSeq\_16Dec04:\*

1: GenSeqDP1980s:\*

2: GenSeqDP2001s:\*

3: GenSeqDP2000s:\*

4: GenSeqDP2001s:\*

5: GenSeqDP2002s:\*

6: GenSeqDP2003aB:\*

7: GenSeqDP2003bS:\*

8: GenSeqDP2004s:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

#### Result No. Score Query Match Length DB ID Description

Result No.	Score	Query	Match	Length	DB	ID	Description
1	3406	100.0	652	2	AAR14047		Aar14047 B_thuring
2	3406	100.0	652	2	AAV23207		Aay23207 Amino aci
3	3406	100.0	652	2	AAV23212		Aay23212 Amino aci
4	3406	100.0	652	3	AAV70441		Aay70441 Bacillus
5	3406	100.0	652	6	ABW01052		Abw01052 Bacillus
6	3406	100.0	652	7	ABW01050		Abw01050 Bacillus
7	3406	100.0	652	8	ADR89425	cry3Bb, 1	Adr89425 cry3Bb, 1
8	3402	99.9	652	2	AAV23205		Aay23205 Amino aci
9	3401	99.9	652	2	AAV23178		Aay23178 Amino aci
10	3401	99.9	652	3	AAV70443		Aay70443 Synthetic
11	3401	99.9	652	6	ABU09194		Abu09194 Bacillus
12	3401	99.9	652	7	ABW01052		Abw01052 Bacillus
13	3400	99.8	652	2	AAV23195		Aay23195 Amino aci
14	3400	99.8	652	2	AAV23187		Aay23187 Amino aci
15	3399	99.8	652	2	AAV23193		Aay23193 Amino aci
16	3399	99.8	652	2	AAV23198		Aay23198 Amino aci
17	3398	99.8	652	2	AAV23175		Aay23175 Amino aci
18	3398	99.8	652	2	AAV23184		Aay23184 Amino aci
19	3398	99.8	652	2	AAV23192		Aay23192 Amino aci
20	3396	99.7	652	2	AAV23203		Aay23203 Amino aci
21	3396	99.7	652	2	AAV23177		Aay23177 Amino aci
22	3395	99.7	652	2	AAV23176		Aay23176 Amino aci
23	3395	99.7	652	2	AAV23188		Aay23188 Amino aci
24	3393	99.6	652	2	AAV23181		Aay23181 Amino aci
25	3393	99.6	652	2	AAV23204		Aay23204 Amino aci



Qy	541	LFLKESSNSIAKPKVTLNSAALLORYRVRVASTTNLRLFYONSNNDFLVYINKTMNK	600	Db	1	MNPNNRSEHDTIKVTPNSELQTINHNOYPLADNPNSTLLEBNYKEFLRMTEDSSTEVDLNS	60
Db	541	LFLKESSNSIAKPKVTLNSAALLORYRVRVASTTNLRLFYONSNNDFLVYINKTMNK	600	Qy	61	TVKDAVGTG1SYVGQ1LGVGVG1PFGAGALTTSFOSFLANTIWPSPADPKAFMAQEVEVLDK	120
Qy	601	DDDLITYQFDLATTNSNCMFGSKDNELLIGAESFVSNEKIVIDKIEFTIPVQL	652	Db	61	TVKDAVGTG1SYVGQ1LGVGVG1PFGAGALTTSFOSFLANTIWPSPADPKAFMAQEVEVLDK	120
Db	601	DDDLITYQFDLATTNSNCMFGSKDNELLIGAESFVSNEKIVIDKIEFTIPVQL	652	Qy	121	KIEBEYAKSKAKAELQGLQNNFEDYVNALNSWKTPLSRSRSQRKELFSQAESHFRN	180
RESULT 2							
AAV23207	1D	AAV23207 standard; protein;	652 AA.	Qy	181	SMPSFAVSKFEVLFPLIPTYAQAANTHLLLKDQYFGEEWGYSSVEDAEFYHQLKLTQQY	240
XX	AC	AAV23207;		Db	121	KIEBEYAKSKAKAELQGLQNNFEDYVNALNSWKTPLSRSRSQRKELFSQAESHFRN	180
XX	DT	24-AUG-1999 (first entry)		Qy	241	TDHCVNMYNVNGLNGLRSYDAAWKFKFRFRRENTLTVLDLIVLFPFDIIRLYSKGVKTBL	300
XX	DE	Amino acid sequence of the wild type cry3Bb protein.		Db	241	TDHCVNMYNVNGLNGLRSYDAAWKFKFRFRRENTLTVLDLIVLFPFDIIRLYSKGVKTBL	300
XX	CW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm;		Qy	301	TRDIFTDPIFSLNTLQEQYGPFTLISIENSIRKPHLFYDLYQGIEFHTRLQPGYFKGDSFNYW	360
KW	Diabrotica undecimpunctata howardi Barber; transgenic plant;			Db	301	TRDIFTDPIFSLNTLQEQYGPFTLISIENSIRKPHLFYDLYQGIEFHTRLQPGYFKGDSFNYW	360
KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.			Qy	361	SGNYVETRPSIGSSKTTSPYFGDKSTEPVQLUSFDGQKVRTTANTDVAAPNGKVYLG	420
XX	Bacillus thuringiensis.			Db	361	SGNYVETRPSIGSSKTTSPYFGDKSTEPVQLUSFDGQKVRTTANTDVAAPNGKVYLG	420
OS	W0993124-8-A1.			Qy	421	VTKVDPSYDDQKNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPIEKEVSHQLYAE	480
PN	24-JUN-1999.			Db	421	VTKVDPSYDDQKNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPIEKEVSHQLYAE	480
XX	PD			Qy	481	CFLIMODRGTIPPFTHRSVDFNTIDAKBKTQLPVVKAYALSGASILIEGPGPTGGLN	540
XX	PF			Db	481	CFLIMODRGTIPPFTHRSVDFNTIDAKBKTQLPVVKAYALSGASILIEGPGPTGGLN	540
XX	17-DEC-1998;	98WO-US026852.		Qy	541	LFLKESSNSIAKPKVTLNSAALLQYVIRVASTTNLRLFQNSNDPLVYINKTMNK	600
PR	18-DEC-1997;	97US-00993110.		Db	541	LFLKESSNSIAKPKVTLNSAALLQYVIRVASTTNLRLFQNSNDPLVYINKTMNK	600
PR	18-DEC-1997;	97US-00993722.		Qy	601	DDDLITYQFDLATTNSNCMFGSKDNELLIGAESFVSNEKIVIDKIEFIPVQL	652
PR	18-DEC-1997;	97US-00993775.		Db	601	DDDLITYQFDLATTNSNCMFGSKDNELLIGAESFVSNEKIVIDKIEFIPVQL	652
PR	18-DEC-1997;	97US-00996441.					
XX	(ECOG- ) ECOGEN INC.						
PA	(MONS ) MONSANTO CO.						
XX	English L, Brussock SM, Malvar TM, Bryson JW, Rulesza CA;						
PI	Walters FS, Slatin SL, Von Tersch MA, Romano C;						
XX	WPI; 1999-395184/3.						
XX	PT	Insecticidal Bacillus thuringiensis proteins.					
PS	XX	Disclosure: Page 480-482; 512pp; English.					
XX	CC	AAV23172-Y23206, and AAV23208-X23209 represent new Bacillus thuringiensis Cry3Bb mutant proteins. The specification also describes methods of altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAV23207 represent the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte) and insecticide resistance. The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance					
XX	SQ	Sequence 652 AA;					
Query Match	100.0%;	Score 3406; DB 2; Length 652;					
Best Local Similarity	100.0%;	Pre. No. 7, 4e-277;					
Matches	652;	Conservative 0; Mismatches 0; Indels 0; Gaps 0;					
Qy	1	MNPNNRSEHDTIKVTPNSELQTINHNOYPLADNPNSTLLEBNYKEFLRMTEDSSTEVDLNS	60	PP	17-DEC-1998;	98WO-US026852.	
XX				PR	18-DEC-1997;	97US-00993170.	
XX				PR	18-DEC-1997;	97US-00993122.	
XX				PR	18-DEC-1997;	97US-0099375.	
XX				PR	18-DEC-1997;	97US-00996441.	
PA	(ECOG- ) ECOGEN INC.						



Db	241	TDHCVCNWNVGLNRGSTDAAWKFNRFRREMTLTVLPLIVLFPFYDIRLYSKGVKTEL	300	CC from the transformed maize plant cell. A transgenic plant expressing the CC modified polynucleotide is useful for controlling Coleopteran insect CC infestation in a field of crop plants. The modified polynucleotide is CC useful for producing transgenic plants expressing higher levels of the CC insect controlling B. thuringiensis delta-endotoxin. The modified CC polynucleotide provides up to 10 fold higher levels of insect controlling CC delta-endotoxin relative to the highest levels obtained using prior CC compositions. In particular, maize expressing higher levels of CC the Cry3Bb protein, designed to exhibit increased toxicity toward CC Coleopteran pests deliver superior levels of insect protection and are CC less likely to sponsor development of populations of target insects that CC are resistant to the insecticidally active protein. Improved control of CC susceptible target insect pests and season long protection from insect CC pathogens is achieved using the modified polynucleotide. The modified CC polynucleotide reduces the number of transgenic events that have to be CC screened in order to identify one which contains beneficial levels of one CC or more insect controlling compositions. The present sequence represents CC the amino acid sequence of <i>Bacillus thuringiensis</i> delta endotoxin Cry3Bb1 XX
Qy	301	TRDIFTDPFLSINTLQECPTFELSIENSRKPHLFDFYDQGIEFPHTRLQGYFCKDSFNYW	360	Query Match 100.0%; Score 3406; DB 6; Best Local Similarity 100.0%; Pred. No. 7.4-277; Matches 652; Conservative 0; Mismatches 0; Indels 0; Gaps 0;
Db	301	TRDIFTDPFLSINTLQECPTFELSIENSRKPHLFDFYDQGIEFPHTRLQGYFCKDSFNYW	360	Qy 1 MNPNRSHDTHDKVTPNSBELQTNHNOFLADNPNSTLBBLYKEFLRMTEDSSTEVDLNS 60 Db 1 MNPNRSHDTHDKVTPNSBELQTNHNOFLADNPNSTLBBLYKEFLRMTEDSSTEVDLNS 60
Qy	361	SGNYVETRSTIGSSKTTISPFYGDKSTEVKQUSFDGKXVYRANTDVAWNGKYLG	420	Qy 1 MNPNRSHDTHDKVTPNSBELQTNHNOFLADNPNSTLBBLYKEFLRMTEDSSTEVDLNS 60 Db 1 MNPNRSHDTHDKVTPNSBELQTNHNOFLADNPNSTLBBLYKEFLRMTEDSSTEVDLNS 60
Db	361	SGNYVETRSTIGSSKTTISPFYGDKSTEVKQUSFDGKXVYRANTDVAWNGKYLG	420	Qy 1 MNPNRSHDTHDKVTPNSBELQTNHNOFLADNPNSTLBBLYKEFLRMTEDSSTEVDLNS 60 Db 1 MNPNRSHDTHDKVTPNSBELQTNHNOFLADNPNSTLBBLYKEFLRMTEDSSTEVDLNS 60
Qy	421	VTKVDFSQYDQNETSTQTYDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA	480	Qy 61 TVKDAVGTGISYVQGQILGUVGYPFAGALTFSYOSFLNTIWPSPADPKAFMAQVEVLIDK 120 Db 61 TVKDAVGTGISYVQGQILGUVGYPFAGALTFSYOSFLNTIWPSPADPKAFMAQVEVLIDK 120
Db	421	VTKVDFSQYDQNETSTQTYDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA	480	Qy 61 TVKDAVGTGISYVQGQILGUVGYPFAGALTFSYOSFLNTIWPSPADPKAFMAQVEVLIDK 120 Db 61 TVKDAVGTGISYVQGQILGUVGYPFAGALTFSYOSFLNTIWPSPADPKAFMAQVEVLIDK 120
Qy	481	CFLMDQRRTTIPFPTWTHSVDFTNTIDEAKITQDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA	540	Qy 121 KIEEYAKSKAELBQGLQDNNEFYDYNVNAWSKCTPLSRSKRSQDRRELFSQAEHPRN 180 Db 121 KIEEYAKSKAELBQGLQDNNEFYDYNVNAWSKCTPLSRSKRSQDRRELFSQAEHPRN 180
Db	481	CFLMDQRRTTIPFPTWTHSVDFTNTIDEAKITQDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA	540	Qy 181 SMPSFAVSKFELVFLPLPTAQANTHLLKKDQVQEWGYSSEDVAFYHQLKLTKQY 240 Db 181 SMPSFAVSKFELVFLPLPTAQANTHLLKKDQVQEWGYSSEDVAFYHQLKLTKQY 240
Qy	541	LPLKESSNSIAKFKYTLNSAALLQRYRIVRASYTNTLRLFVQNSNNDFLVIYINKTMNK	600	Qy 241 TDHCVNWNVGLNRGSTDYDVKFNRFRRENTLYTLDLIVLFPYDILYKSGVKTEL 300 Db 241 TDHCVNWNVGLNRGSTDYDVKFNRFRRENTLYTLDLIVLFPYDILYKSGVKTEL 300
Db	541	LPLKESSNSIAKFKYTLNSAALLQRYRIVRASYTNTLRLFVQNSNNDFLVIYINKTMNK	600	Qy 301 TRDIFTDPFLSINTLQECPTFELSIENSRKPHLFDFYDQGIEFPHTRLQGYFCKDSFNYW 360 Db 301 TRDIFTDPFLSINTLQECPTFELSIENSRKPHLFDFYDQGIEFPHTRLQGYFCKDSFNYW 360
Qy	601	DDDLTYQTDFLATTNSNNMGSFDKDNELIGAESFSVSNKIXYDKEFIPVQL	652	Qy 361 SGNYVETRSPIGSSKTTISPFYGDKSTEVKQUSFDGKXVYRANTDVAWNGKYLG 420 Db 361 SGNYVETRSPIGSSKTTISPFYGDKSTEVKQUSFDGKXVYRANTDVAWNGKYLG 420
Db	601	DDDLTYQTDFLATTNSNNMGSFDKDNELIGAESFSVSNKIXYDKEFIPVQL	652	Qy 421 VTKVDFSQYDQNETSTQTYDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA 480 Db 421 VTKVDFSQYDQNETSTQTYDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA 480
Qy	652	ABU09192 standard; protein; 652 AA.		Qy 481 CFIMQDRGTIPFPTWTHSVDFTNTIDEAKITQDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA 540 Db 481 CFIMQDRGTIPFPTWTHSVDFTNTIDEAKITQDPSKRNNGVSAQDSDQPPETDEPLKAYSHQLNAYA 540
Db	652	ABU09192; AC ABU09192; XX		Qy 541 LPLKESSNSIAKFKYTLNSAALLQRYRIVRASYTNTLRLFVQNSNNDFLVIYINKTMNK 600 Db 541 LPLKESSNSIAKFKYTLNSAALLQRYRIVRASYTNTLRLFVQNSNNDFLVIYINKTMNK 600
Qy	12-JUN-2003	(first entry)		XX
Db	12-JUN-2003	(first entry)		XX
DB	DB	Bacillus thuringiensis delta endotoxin Cry3Bb1.		XX
KW	KW	Cry3Bb1; delta-endotoxin; plant; transgenic; insecticide; crystal 3;		XX
KW	KW	Cry3; Coleopteran insect infestation; increased toxicity;		XX
KW	KW	season long protection; beetle.		XX
OS	OS	Bacillus thuringiensis.		XX
PN	PN	US6501099-B1.		XX
XX	XX	31-DEC-2002.		XX
XX	XX	19-AUG-1999; 99US-00377466.		XX
PF	PF	19-AUG-1999; 99US-00377466.		XX
PA	PA	(MONS ) MONSANTO TECHNOLOGY LLC.		XX
PA	PA	Romano CP;		XX
DR	DR	WPI; 2003-352192/33.		XX
DR	DR	N-PSDB; ABX95179.		XX
XX	XX	New modified polynucleotide useful for controlling Coleopteran insect infestation in a field of crop plants encodes insecticidal crystal 3		XX
PT	PT	Bacillus thuringiensis delta-endotoxin.		XX
PS	PS	Disclosure: Col 49-54; 107pp; English.		XX
CC	CC	The invention relates to a modified polynucleotide which encodes an insecticidal crystal 3 (Cry3). <i>Bacillus thuringiensis</i> delta-endotoxin, such as Cry3b. The modified polynucleotide is useful for producing a transformed cell, by introducing the modified polynucleotide into a cell such as a plant cell (preferably a maize cell) or a microbial cell. The modified polynucleotide is useful for producing transformed maize plant by introducing the modified polynucleotide into a maize plant, selecting a transformed maize plant cell and regenerating a maize plant		XX
RESULT 6	ABW01050	ABW01050 standard; protein; 652 AA.		XX
ID	ID	ABW01050		XX

ABW01050;	Db	421	VTKVDFSYDDQKNETSTQYDSKRNNGHVSAQSDISDOLPPETDEPLEKAYSHOLNYAE 480
AC	Qy	481	CFIMODRGTIPFFWTHRSVDFNTIDEKITQLPVVKAYALSGASASIEFGPFTGGNL 540
DT	Db	481	CFLMDRGTIPFFWTHRSVDFNTIDEKITQLPVVKAYALSGASASIEFGPFTGGNL 540
DE	Qy	541	LFLKESNSNIAFKVTLNSAIIORRYRIRYASTNLRLFVQNSNNDFLVIVYIKTMNK 600
XX	Db	541	LFLKESNSNIAFKVTLNSAIIORRYRIRYASTNLRLFVQNSNNDFLVIVYIKTMNK 600
XX	Qy	601	DDDTIYQTFPLATINSMGFSGDKNELIGAESFSNEKIVYDKEFIPYQ 652
XX	Db	601	DDDTIYQTFPLATINSMGFSGDKNELIGAESFSNEKIVYDKEFIPYQ 652
XX	XX		
Bacillus thuringiensis	XX		
US2003115630-A1.	XX		
PD	XX		
19-JUN-2003.	XX		
XX	PP	29-AUG-2002; 2002US-00232665.	
XX	XX	99US-00377466.	
(ROMA/)	XX		
ROMANO C P.	XX		
PI	XX		
XX	WPI:	2003-810928/76.	
XX	N-PSDB;	AAD61783/76.	
XX	DR:		
XX	PS:	Page 28-29; Opp; English.	
XX	CC	The invention relates to novel transgenic plants comprising <i>Bacillus thuringiensis</i> Cry3-delta-endotoxin gene or its variants having coleopteran inhibitory activity. The invention is useful for controlling coleopteran insect infestation in a field of crop plants. The present sequence is <i>B. thuringiensis</i> Cry3Bb1-delta-endotoxin protein.	
XX	CC	Sequence 652 AA;	
XX	CC	Query Match 100.0%; Score 3406; DB 7; Length 652;	
XX	CC	Best Local Similarity 100.0%; Pred. No. 7, 4.e-277; Mismatches 0; Indels 0; Gaps 0;	
XX	CC	Matches 652; Conservative 0; Mismatches 0; Indels 0; Gaps 0;	
XX	CC	1 MNPNNRSEHDITKVTNPSELQTMHNQYPLADNPNSTLEIYKEFLRMTEDSSTEVLDS 60	
XX	CC	1 MNPNNRSEHDITKVTNPSELQTMHNQYPLADNPNSTLEIYKEFLRMTEDSSTEVLDS 60	
Db	Qy	61 TVKDAVGTGISVQIQLGVGVGPFGAATSFQSFINTIWSADPMKAFMAQVEVLIDK 120	
Db	Qy	61 TVKDAVGTGISVQIQLGVGVGPFGAATSFQSFINTIWSADPMKAFMAQVEVLIDK 120	
Db	Qy	121 KIEEYAKSKAELAQLOGIQQNFDDYVNAIWSWKTPLSRSKRSQDRTRLEFSQAEHFRN 180	
Db	Qy	121 KIEEYAKSKAELAQLOGIQQNFDDYVNAIWSWKTPLSRSKRSQDRTRLEFSQAEHFRN 180	
Db	Qy	181 SMPSFAVSKFPEVLFPLIYQAAANTHILLKDQVFGEWGYSSEDVAEFYHQLKLTKQY 240	
Db	Qy	181 SMPSFAVSKFPEVLFPLIYQAAANTHILLKDQVFGEWGYSSEDVAEFYHQLKLTKQY 240	
Db	Qy	241 TDHCVNWNVNGLNGLGRGSTDYDAWVKENRFRREMTLTVLIVLFPFDIIRYLSKGYKTEL 300	
Db	Qy	241 TDHCVNWNVNGLNGLGRGSTDYDAWVKENRFRREMTLTVLIVLFPFDIIRYLSKGYKTEL 300	
Db	Qy	301 TROJFTDPIFSINTLQEYQPTFLSIENSIRKPHLFDTLQGTFGKDSFNYW 360	
Db	Qy	301 TROJFTDPIFSINTLQEYQPTFLSIENSIRKPHLFDTLQGTFGKDSFNYW 360	
Db	Qy	361 SGNYVETRPSIGSSKTTISPFYGDKSTPQVQLSFDGCKVYRTANTDVAAMPNGKVYLG 420	
Db	Qy	361 SGNYVETRPSIGSSKTTISPFYGDKSTPQVQLSFDGCKVYRTANTDVAAMPNGKVYLG 420	
Db	Qy	421 VTKVDFSYDDQKNETSTQYDSKRNNGHVSAQSDISDOLPPETDEPLEKAYSHOLNYAE 480	

CC invention, and methods for their production, are useful for the  
 CC production of organisms with pesticide resistance, specifically bacteria  
 CC and plants. These organisms are useful for generating altered or improved  
 CC delta-endotoxin or delta-endotoxin-associated proteins that have  
 CC pesticidal activity, or for detecting the presence of delta-endotoxin or  
 CC delta-endotoxin-associated proteins or nucleic acids in products or  
 CC organisms.

XX Sequence 652 AA;

Query Match 100.0%; Score 3406; DB 8; Length 652;  
 Best Local Similarity 100.0%; Pred. No. 7. 4e-277;  
 Matches 652; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 Qy 1. MNPNNRSEDTIKVTPNSELQTNHNOYPLADPNPNSTLLEELNKTFLRMTEDSSTEVDLNS 60  
 Db 1. MNPNNRSEDTIKVTPNSELQTNHNOYPLADPNPNSTLLEELNKTFLRMTEDSSTEVDLNS 60  
 Qy 61. TVKDAVGTRISVQGQILGVPPAGALTSTFYQSFLNTIWPSPADPKMAFQVEVLIDK 120  
 Db 61. TVKDAVGTRISVQGQILGVPPAGALTSTFYQSFLNTIWPSPADPKMAFQVEVLIDK 120  
 Qy 121. KIEEYAKSKALAEQGLQNLNFEDYVNAIWNKETPLSLRSKRSQDRTRFLPQAEASHFRN 180  
 Db 121. KIEEYAKSKALAEQGLQNLNFEDYVNAIWNKETPLSLRSKRSQDRTRFLPQAEASHFRN 180  
 Qy 181. SMPSFAVSEKPEVLFPLPTAQAANTHLLIILKDAQVFGEEWYGSSESDVAEYFHROKLQTQY 240  
 Db 181. SMPSFAVSEKPEVLFPLPTAQAANTHLLIILKDAQVFGEEWYGSSESDVAEYFHROKLQTQY 240  
 Qy 241. TDHCVNWNVGLNLRGSTYDANKFENFRREMTLTVLFLIVLFPFYDILRYSKGKVTEL 300  
 Db 241. TDHCVNWNVGLNLRGSTYDANKFENFRREMTLTVLFLIVLFPFYDILRYSKGKVTEL 300  
 Qy 301. TRDIFTDPFLSNTLQEQYCPPTFELSIENSTRKPHLFDFYQGIEFPTFQGKDSFNYW 360  
 Db 301. TRDIFTDPFLSNTLQEQYCPPTFELSIENSTRKPHLFDFYQGIEFPTFQGKDSFNYW 360  
 Qy 361. SGNYVETRISIGSSKTTISPFYGDKSTBFVQKLSFDGKCYVRTIANTDAAPNGKTYLG 420  
 Db 361. SGNYVETRISIGSSKTTISPFYGDKSTBFVQKLSFDGKCYVRTIANTDAAPNGKTYLG 420  
 Qy 421. VTKYDFSQDDQNETSTQTYDSKRNNNGHVSADSIDQDQPPETDPELKAYSHQIYAE 480  
 Db 421. VTKYDFSQDDQNETSTQTYDSKRNNNGHVSADSIDQDQPPETDPELKAYSHQIYAE 480  
 Qy 481. CFLMDQRRTIPPTWTHSDPFTNTIDEAKTITOLPVVKAIALSGASIEGPGFTGQNL 540  
 Db 481. CFLMDQRRTIPPTWTHSDPFTNTIDEAKTITOLPVVKAIALSGASIEGPGFTGQNL 540  
 Qy 541. LFLKESSNSIAKFKVTLNSAALLORYRVRAYASTTNRFLVYINKTMNK 600  
 Db 541. LFLKESSNSIAKFKVTLNSAALLORYRVRAYASTTNRFLVYINKTMNK 600  
 Qy 601. DDDLTYQFDLATTNSNNGSGDKNELIGAESFVSNEKIVYDKEFIPVQL 652  
 Db 601. DDDLTYQFDLATTNSNNGSGDKNELIGAESFVSNEKIVYDKEFIPVQL 652  
 Qy RESULT 8  
 ID AAY23205 standard protein; 652 AA.  
 XX  
 XX AC AAY23205;  
 XX DT 24-AUG-1999 (First entry)  
 XX DE Amino acid sequence of Cry3Bb.11095 polypeptide.  
 XX XX Cry3Bb; mutant; insecticidal activity; insecticidal specificity;  
 XX coleoptera; southern corn rootworm; western corn root worm;  
 XX Diabrotica undecimpunctata Howard; transgenic plant;  
 XX Diabrotica virgifera virgifera LeConte; insecticide resistance.

XX Synthetic.  
 OS Bacillus thuringiensis.  
 OS  
 XX W09931248-A1.  
 PN 24-JUN-1999.  
 PD XX 17-DEC-1998; 98WO-US0266852.  
 PR XX 18-DEC-1997; 97US-00993170.  
 PR XX 18-DEC-1997; 97US-00993372.  
 PR XX 18-DEC-1997; 97US-00993375.  
 PR XX 18-DEC-1997; 97US-00996441.  
 PA (ECOG- ) ECOGEN INC.  
 PA (MONS ) MONSANTO CO.  
 PI English L, Brussock SM, Malvar TM, Bryson JW, Ruelasza CA;  
 PI Walters FS, Slatin SL, Von Tersch MA, Romano C;  
 XX DR WPI; 1999-395184/33.  
 XX Insecticidal Bacillus thuringiensis proteins.  
 PS Claim 39; Page 457-460; 512pp; English.  
 XX AAY23172-Y23206, and AAY23208-Y23209 represent new *Bacillus thuringiensis*  
 CC cry3Bb mutant proteins. The specification also describes methods of  
 CC altering *Bacillus thuringiensis* Cry3Bb. The B. thuringiensis Cry3Bb  
 CC polypeptide was modified to have improved insecticidal activity or  
 CC enhanced insecticidal specificity against a target insect. The  
 CC modification comprises at least one amino acid substitution, addition, or  
 CC deletion in the primary sequence of the native or unmodified Cry3Bb  
 CC polypeptide, wherein the substitution or deletion occurs at a position  
 CC corresponding to from about amino acids 1-365 of the unmodified  
 CC polypeptide sequence (AAY23207 represents the wild type Cry3Bb protein).  
 CC The polypeptide can be used to kill coleopteran pests, especially by  
 CC application to the environment. It is especially useful against southern  
 CC corn rootworm and western corn root worm (Diabrotica undecimpunctata  
 CC Howard Barber, and Diabrotica virgifera virgifera LeConte respectively).  
 CC The mutant cry3Bb polynucleotides can also be used to produce transgenic  
 CC plants with increased insecticide resistance.  
 XX SQ Sequence 652 AA;  
 Query Match 99.9%; Score 3402; DB 2; Length 652;  
 Best Local Similarity 99.8%; Pred. No. 1.e-276;  
 Matches 651; Conservative 1; Mismatches 0; Indels 0; Gaps 0;  
 Qy 1. MNPNNRSEDTIKVTPNSELQTNHNOYPLADPNPNSTLLEELNKEFRLMTEDSSTEVDLNS 60  
 Db 1. MNPNNRSEDTIKVTPNSELQTNHNOYPLADPNPNSTLLEELNKEFRLMTEDSSTEVDLNS 60  
 Qy 61. TVKDAVGTRISVQGQILGVPPAGALTSTFYQSFLNTIWPSPADPKMAFQVEVLIDK 120  
 Db 61. TVKDAVGTRISVQGQILGVPPAGALTSTFYQSFLNTIWPSPADPKMAFQVEVLIDK 120  
 Qy 121. KIEEYAKSKALAEQGLQNLNFEDYVNAIWNKETPLSLRSKRSQDRTRFLPQAEASHFRN 180  
 Db 121. KIEEYAKSKALAEQGLQNLNFEDYVNAIWNKETPLSLRSKRSQDRTRFLPQAEASHFRN 180  
 Qy 181. SMPSFAVSKPEVLFPLPTAQAANTHLLIILKDAQVFGEEWYGSSESDVAEYFHROKLQTQY 240  
 Db 181. SMPSFAVSKPEVLFPLPTAQAANTHLLIILKDAQVFGEEWYGSSESDVAEYFHROKLQTQY 240  
 Qy 241. TDHCVNWNVGLNLRGSTYDANKFENFRREMTLTVLFLIVLFPFYDILRYSKGKVTEL 300  
 Db 241. TDHCVNWNVGLNLRGSTYDANKFENFRREMTLTVLFLIVLFPFYDILRYSKGKVTEL 300  
 Qy 301. TRDIFTDPFLSNTLQEQYCPPTFELSIENSTRKPHLFDFYQGIEFPTFQGKDSFNYW 360  
 Db 301. TRDIFTDPFLSNTLQEQYCPPTFELSIENSTRKPHLFDFYQGIEFPTFQGKDSFNYW 360  
 Qy 361. SGNYVETRISIGSSKTTISPFYGDKSTBFVQKLSFDGKCYVRTIANTDAAPNGKTYLG 420  
 Db 361. SGNYVETRISIGSSKTTISPFYGDKSTBFVQKLSFDGKCYVRTIANTDAAPNGKTYLG 420  
 Qy 421. VTKYDFSQDDQNETSTQTYDSKRNNNGHVSADSIDQDQPPETDPELKAYSHQIYAE 480  
 Db 421. VTKYDFSQDDQNETSTQTYDSKRNNNGHVSADSIDQDQPPETDPELKAYSHQIYAE 480  
 Qy 481. CFLMDQRRTIPPTWTHSDPFTNTIDEAKTITOLPVVKAIALSGASIEGPGFTGQNL 540  
 Db 481. CFLMDQRRTIPPTWTHSDPFTNTIDEAKTITOLPVVKAIALSGASIEGPGFTGQNL 540  
 Qy 541. LFLKESSNSIAKFKVTLNSAALLORYRVRAYASTTNRFLVYINKTMNK 600  
 Db 541. LFLKESSNSIAKFKVTLNSAALLORYRVRAYASTTNRFLVYINKTMNK 600  
 Qy 601. DDDLTYQFDLATTNSNNGSGDKNELIGAESFVSNEKIVYDKEFIPVQL 652  
 Db 601. DDDLTYQFDLATTNSNNGSGDKNELIGAESFVSNEKIVYDKEFIPVQL 652  
 Qy RESULT 8  
 ID AAY23205  
 XX DT 24-AUG-1999 (First entry)  
 XX DE Amino acid sequence of Cry3Bb.11095 polypeptide.  
 XX XX Cry3Bb; mutant; insecticidal activity; insecticidal specificity;  
 XX coleoptera; southern corn rootworm; western corn root worm;  
 XX Diabrotica undecimpunctata Howard; transgenic plant;  
 XX Diabrotica virgifera virgifera LeConte; insecticide resistance.

361 SGNVETRPSIGSSKNTSPPYGDKSTEPVYOKLSPDGOKYRTIANTDVAWPGKVTLG 420  
 Qy ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 361 SGNVETRPSIGSSKNTSPPYGDKSTEPVYOKLSPDGOKYRTIANTDVAWPGKVTLG 420  
 Db ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 421 VTKVDFEQYDDKNETSTQYDTSKRNGHVSQAQSDQLPETTDEPLKAYSHOLNAYE 480  
 Qy ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 421 VTKVDFEQYDDKNETSTQYDTSKRNGHVSQAQSDQLPETTDEPLKAYSHOLNAYE 480  
 Db ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 481 CFLM0DERGTTFFPTWTHRSDFPNTDAEKITOLPVVKAYLSSASITEGPGFTGGNL 540  
 Qy ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 481 CFLM0DRGTTFFPTWTHRSDFPNTDAEKITOLPVVKAYLSSASITEGPGFTGGNL 540  
 Db ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 541 LFLKESSNSIAKEFKVTLNSAALLQRTVRVIRAYASTNLRLPVQNSNDPFLVYIATKMK 600  
 Qy ||||| ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 541 LFLKESSNSIAKEFKVTLNSAALLQRTVRVIRAYASTNLRLPVQNSNDPFLVYIATKMK 600  
 Db ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 601 DDDITYQDFPLATTNSNGFSGDKNELLIGAESFVSNEKIVYDKEFIPVQL 652  
 Qy ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 601 DDDITYQDFPLATTNSNGFSGDKNELLIGAESFVSNEKIVYDKEFIPVQL 652  
 Db ||||| ||||| ||||| ||||| ||||| ||||| ||||| |||||  
 RESULT 9  
 AAY23178 standard protein; 652 AA.  
 XX  
 ID AAY23178;  
 XX  
 DT 24-AUG-1999 (first entry)  
 XX  
 DE Amino acid sequence of Cry3Bb.11227 polypeptide.  
 XX  
 KW mutant; insecticidal activity; insecticidal specificity;  
 KW coleoptera; southern corn rootworm; western corn root worm;  
 KW Diabrotica undecimpunctata howardi Barber; transgenic plant;  
 KW Diabrotica virgifera virgifera LeConte; insecticide resistance.  
 XX  
 Synthetic.  
 OS Bacillus thuringiensis.  
 XX  
 WO9931248-A1.  
 PN  
 XX  
 PD 24-JUN-1999.  
 XX  
 PF 17-DEC-1998; 98WO-US026852.  
 XX  
 PR 18-DEC-1997; 97US-00993170.  
 PR 18-DEC-1997; 97US-00993722.  
 PR 18-DEC-1997; 97US-00993775.  
 PR 18-DEC-1997; 97US-00996441.  
 XX  
 PA (ECOG INC.  
 (MONS ) MONSANTO CO.  
 XX  
 English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;  
 PI Walters FS, Slatin SL, Von Tersch MA, Romano C;  
 XX  
 DR 199-395184/33.  
 XX  
 Insecticidal Bacillus thuringiensis proteins.  
 XX  
 Claim 39; Page 306-308; 512pp; English.  
 XX  
 PS AAY23172-Y23206, and AAX3208-X23209 represent new *Bacillus thuringiensis*  
 CC Cry3Bb mutant proteins. The specification also describes methods of  
 CC altering *Bacillus thuringiensis* Cry3Bb. The B. thuringiensis Cry3Bb  
 CC polypeptide was modified to have improved insecticidal activity or  
 CC enhanced insecticidal specificity against a target insect. The  
 CC modification comprises at least one amino acid substitution, or  
 CC deletion in the primary sequence of the native or unmodified Cry3Bb  
 CC polypeptide, wherein the substitution or deletion occurs at a position  
 CC corresponding to from about amino acids 1-365 of the unmodified  
 CC polypeptide sequence (AY23207 represents the wild type Cry3Bb protein).

CC The polypeptide can be used to kill coleopteran pests, especially by  
 CC application to the environment. It is especially useful against southern  
 CC corn rootworm and western corn root worm, (*Diabrotica undecimpunctata*  
 CC howardi Barber, and *Diabrotica virgifera virgifera* LeConte respectively).  
 CC the mutant cry3Bb polypeptides can also be used to produce transgenic  
 CC plants with increased insecticide resistance  
 XX  
 Sequence 652 AA;  
 SQ  
 Query Match 99.9%; Score 3401; DB 2; Length 652;  
 Best Local Similarity 99.8%; Pred. No. 1.9e-216;  
 Matches 651; Conservative 0; Mismatches 1; Indels 0; Gaps 0;  
 Matches 651; Conservative 0; Mismatches 1; Indels 0; Gaps 0;  
 1 MNPNRSEHDTIKVTPNSELOTHNQPLADNPNSTEELNKEPLMTEDSSTEVLIDNS 60  
 1 MNPNRSEHDTIKVTPNSELOTHNQPLADNPNSTEELNKEPLMTEDSSTEVLIDNS 60  
 Qy 61 TVKDAVGIGISVYQGQILGTVGVPAGALTFSYOSFLINTIWPSPADPKAFMAQVEVILDK 120  
 Db 61 TVKDAVGIGISVYQGQILGTVGVPAGALTFSYOSFLINTIWPSPADPKAFMAQVEVILDK 120  
 61 TVKDAVGIGISVWSQLGVGVPPAGALTFSYOSFLINTIWPSPADPKAFMAQVEVILDK 120  
 Qy 121 KIEEYAKSKAKAELQGLQNFEDYVNAIWSKTKPLSLRSKRSQDRFLSQAEHFRN 180  
 Db 121 KIEEYAKSKAKAELQGLQNFEDYVNAIWSKTKPLSLRSKRSQDRFLSQAEHFRN 180  
 Qy 181 SMPSPAVSKPEVLFPLTYQAQANTHLLKKDAQVFGEWGYSSEDVAFHYRQLKTCQY 240  
 Db 181 SMPSPAVSKPEVLFPLTYQAQANTHLLKKDAQVFGEWGYSSEDVAFHYRQLKTCQY 240  
 Qy 241 TDHCYVNWYVNLGNGLGRSTYDAWKFRNPREMTLTVDLIVLFPYDTRLYSKGVTEL 300  
 Db 241 TDHCYVNWYVNLGNGLGRSTYDAWKFRNPREMTLTVDLIVLFPYDTRLYSKGVTEL 300  
 Qy 301 TRDIFDPFLSPLNTLQEYGPFLSLENSTRKPHLFDYLOGIJEFTFLQDQYFGKDSFNNW 360  
 Db 301 TRDIFDPFLSPLNTLQEYGPFLSLENSTRKPHLFDYLOGIJEFTFLQDQYFGKDSFNNW 360  
 Qy 361 SGNYVTPRSIGSSKTTSPYGDKSTEYVQLSLSPQYKVTIANTDVAWPGKVYLG 420  
 Db 361 SGNYVTPRSIGSSKTTSPYGDKSTEYVQLSLSPQYKVTIANTDVAWPGKVYLG 420  
 Qy 421 VTKVDFSQYDDQKNETSTQYDTSKRNGHVSQDSIDOLPPTTDBPLEKAYSHOLNAYE 480  
 Db 421 VTKVDFSQYDDQKNETSTQYDTSKRNGHVSQDSIDOLPPTTDBPLEKAYSHOLNAYE 480  
 Qy 481 CPLM0D9RGTIPPTWTHRSDFNTIDAKITQDLYVAYNLSQASLILEGPGETGNNL 540  
 Db 481 CPLM0D9RGTIPPTWTHRSDFNTIDAKITQDLYVAYNLSQASLILEGPGETGNNL 540  
 Qy 541 LPLKESSNSIAKFKVTLNSAAILQYRVRVYASTNLRLFVQNSNDFLVYIYTMKMK 600  
 Db 541 LPLKESSNSIAKFKVTLNSAAILQYRVRVYASTNLRLFVQNSNDFLVYIYTMKMK 600  
 Qy 601 DDDLYQDFPLATTNSNGFSGDNELIIGAESFVSNEKIVYDKEFIPVQL 652  
 Db 601 DDDLYQDFPLATTNSNGFSGDNELIIGAESFVSNEKIVYDKEFIPVQL 652  
 RESULT 10  
 AAY70443  
 ID AAY70443 standard; protein; 652 AA.  
 XX  
 AC AAY70443;  
 XX  
 DT 21-JUN-2000 (first entry)  
 XX  
 DE Synthetic delta-endotoxin, Cry3Bb.  
 XX  
 KW delta-endotoxin; Cry3B; Cry3Bb; Bt toxin; crystal protein; insect pest;  
 KW insecticid; Coleopteran; expression cassette; transgenic plant.  
 XX  
 Synthetic.  
 OS *Bacillus thuringiensis*.

XX	W0200011185-A2.	Qy	541 LFLKESSNSIAKPKVTLNSAALLQYRVRVYASTNURLPVQNSNNDFPLVYINKTANK 600
XX	02-MAR-2000.	Db	541 LFLKESSNSIAKPKVTLNSAALLQYRVRVYASTNURLPVQNSNNDFPLVYINKTANK 600
XX	19-AUG-1999;	Qy	601 DDDLYTQFDLATTNSNNMGSQDKNELIGAESFSVSNKEVYDKEFIPVQL 652
XX	19-AUG-1998;	Db	601 DDDLYTQFDLATTNSNNMGSQDKNELIGAESFSVSNKEVYDKEFIPVQL 652
XX	(MONS ) MONSANTO CO.		
XX	Romano CP;	RESULT 11	
XX	WPI; 2000-246568/21.	ABU09194	
DR	N-PSDB; AA251637.	ID	ABU09194 standard; protein; 652 AA.
PT	Novel expression cassette which express Bacillus thuringiensis Cry3	XX	
PT	delta-endotoxin portion which is toxic to coleopteran insect pests,	XX	
PT	useful for producing transgenic plants with improved insecticidal	XX	
PT	activity.	AC	ABU09194;
XX	Example 2; Page 101-103; 171pp; English.	XX	12-JUN-2003 (first entry)
CC	The present sequence is a synthetic delta-endotoxin, Cry3Bb which is	XX	Bacillus thuringiensis delta endotoxin Cry3Bb.
CC	essentially homologous to the native protein from Bacillus thuringiensis.	XX	
CC	The protein is toxic to Coleopteran insect pests. The corresponding gene	XX	
CC	was used to create cry3Bb variant AA11231 for use in an expression	XX	
CC	cassette which provides improved expression of Cry3B or Cry3B variant	XX	US6501009-B1.
CC	proteins in transgenic plants e.g. maize. Transgenic plants expressing	XX	
CC	higher levels of Cry3B proteins exhibit increased insecticidal activity	XX	
CC	against Coleopteran pests.	XX	31-DEC-2002.
XX	Sequence 652 AA;	XX	PD
PS	Query Match 99.9%; Score 3401; DB 3; Length 652;	XX	19-AUG-1999; 99US-00377166.
Best Local Similarity 99.8%; Pred. No. 1.3e-27;	Matches 651; Conservative 0; Mismatches 1; Indels 0; Gaps 0;	XX	PR 19-AUG-1999; 99US-00377166.
Db	1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTELINYKEFLMTEDSSTEVDLNS 60	XX	PA (MONS ) MONSANTO TECHNOLOGY LLC.
Db	1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTELINYKEFLMTEDSSTEVDLNS 60	XX	WPI: 2003-352192/33.
Qy	1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTELINYKEFLMTEDSSTEVDLNS 60	XX	DR N-PSDB; ABX95181.
Db	61 TVKDAGTGISVYQILGVGVYPAGALTFSYFCOSFLNTWPSDAPWKAFAQEVILIDK 120	XX	
Qy	61 TVKDAGTGISVYQILGVGVYPAGALTFSYFCOSFLNTWPSDAPWKAFAQEVILIDK 120	PT	New modified polynucleotide useful for controlling Coleopteran insect
Db	61 TVKDAGTGISVYQILGVGVYPAGALTFSYFCOSFLNTWPSDAPWKAFAQEVILIDK 120	PT	infestation in a field of crop plants encodes insecticidal crystal 3
CC	Sequence 652 AA;	XX	Bacillus thuringiensis delta-endotoxin.
CC	CC Disclosure; Col 65-70; 107pp; English.	XX	
CC	The invention relates to a modified polynucleotide which encodes an	CC	
CC	insecticidal crystal 3 (Cry3). Bacillus thuringiensis delta-endotoxin such	CC	
CC	as Cry3b. The modified polynucleotide is useful for producing a	CC	
CC	transformed cell, by introducing the modified polynucleotide into a cell	CC	
CC	such as a plant cell (preferably a maize cell) or a microbial cell. The	CC	
CC	modified polynucleotide is useful for producing a transformed maize plant	CC	
CC	by introducing the modified polynucleotide into a maize plant cell,	CC	
CC	selecting a transformed maize plant cell and regenerating a maize plant	CC	
CC	from the transformed maize plant cell. A transgenic plant expressing the	CC	
CC	modified polynucleotide is useful for controlling Coleopteran insect	CC	
CC	infestation in a field of crop plants. The modified polynucleotide is	CC	
CC	useful for producing transgenic plants expressing higher levels of the	CC	
CC	insect controlling B. thuringiensis delta-endotoxin. The modified	CC	
CC	polynucleotide provides up to 10 fold higher levels of insect controlling	CC	
CC	delta-endotoxin relative to the highest levels obtained using prior	CC	
CC	compositions. In particular, transgenic maize expressing higher levels of	CC	
CC	the Cry3B protein designed to exhibit increased toxicity toward	CC	
CC	coleopteran pests deliver superior levels of insect protection and are	CC	
CC	less likely to sponsor development of populations of target insects that	CC	
CC	are resistant to the insecticidally active protein. Improved control of	CC	
CC	susceptible target insect pests and seasonal long protection from insect	CC	
CC	pathogens is achieved using the modified polynucleotide. The modified	CC	
CC	polynucleotide reduces the number of transgenic events that have to be	CC	
CC	screened in order to identify one which contains beneficial levels of one	CC	
CC	or more insect controlling compositions. The present sequence represents	CC	

RESULT 13

AAV23195	Db	121 KIEEYAKSKALAEIQLGLQNNFEDYVNALNSWKTPSLRSRKSQRDIRELFSQAESHFRN 180
ID AAV23195 standard; protein; 652 AA.	QY	181 SMPSFAVKSFKEVFLPTAQAANTHLLLKDQVFGEEWGSSEDVAEYHROLKLTQOY 240
AC	Db	181 SMPSFAVKSFKEVFLPTAQAANTHLLLKDQVFGEEWGSSEDVAEYHROLKLTQOY 240
XX	DT	241 TDHCVNVNGLNGRGSYTDWKVFKNRFRRENTLVTDLIVLFPFYDRLYSKGVKTEL 300
XX	DE	241 TDHCVNVNGLNGRGSYTDWKVFKNRFRRENTLVTDLIVLFPFYDRLYSKGVKTEL 300
XX	DE	241 TDHCVNVNGLNGRGSYTDWKVFKNRFRRENTLVTDLIVLFPFYDRLYSKGVKTEL 300
Cry3Bb; mutant; insecticidal activity; western corn root worm; coleoptera; southern corn root worm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; Diabrotica virgifera virgifera LeConte; insecticide resistance.	QY	301 TRDIFTDPFSLNTLQEQYGPFTLISIENSIRKPHFLDQLOGIEPTLRQPLGQFQKDSFNYW 360
OS Bacillus thuringiensis.	Db	301 TRDIFTDPFSLNTLQEQYGPFTLISIENSIRKPHFLDQLOGIEPTLRQPLGQFQKDSFNYW 360
OS Bacillus thuringiensis.	QY	361 SGNYVETRSPSIGSSKTTISPFYGDKSTEPVQKLSFQGKVRVTANTDVAEYNGKUYLG 420
PN WO931248-A1.	Db	361 SGNYVETRSPSIGSSKTTISPFYGDKSTEPVQKLSFQGKVRVTANTDVAEYNGKUYLG 420
XX	PD	421 VTKVDFSQYDDQKNETSTQTYDSKRNNGHVSADSIDOLPPTDEPLEKASHQLNAYE 480
XX	PD	421 VTKVDFSQYDDQKNETSTQTYDSKRNNGHVSADSIDOLPPTDEPLEKASHQLNAYE 480
PF 17-DEC-1998; 98NO-US026852.	QY	481 CFLMDRGTIPFPTWTRSDPFTNTDAEKITOLPVKAYAISGASIIIEGPGFTGQNL 540
PR 18-DEC-1997; 970S-0093170.	Db	481 CFLMDRGTIPFPTWTRSDPFTNTDAEKITOLPVKAYAISGASIIIEGPGFTGQNL 540
PR 18-DEC-1997; 970S-0093722.	QY	541 LFLKEKSSNSIAKEPKVTLNSAALIQRYRVRIRYASTNTNLRFVQNSNNDFLVYINKTMNK 600
PR 18-DEC-1997; 970S-0093725.	Db	541 LFLKEKSSNSIAKEPKVTLNSAALIQRYRVRIRYASTNTNLRFVQNSNNDFLVYINKTMNK 600
PA (ECOG-) ECOGEN INC.	QY	601 DDDITYQFFDLATTNSNMGFSGDKNEKLIIGAESFVSNEKIVIDKIEFIPVQL 652
PA (MONS ) MONSANTO CO.	Db	601 DDDITYQFFDLATTNSNMGFSGDKNEKLIIGAESFVSNEKIVIDKIEFIPVQL 652
XX	DR	RESULT 14
XX	XX	AAV23187 standard; protein; 652 AA.
XX	XX	AAV23187
XX	XX	AC AAV23187;
XX	XX	DT 24-AUG-1999 (first entry)
XX	XX	DE Amino acid sequence of Cry3Bb.11236 polypeptide.
CC AAY23172-Y23206, and AAX23208-X23209 represent new <i>Bacillus thuringiensis</i> Cry3Bb mutant proteins. The specification also describes methods of altering <i>Bacillus thuringiensis</i> Cry3Bb. The <i>B. thuringiensis</i> Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAV23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte) respectively. The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.	XX	Cry3Bb; mutant; insecticidal activity; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; Diabrotica virgifera virgifera LeConte; insecticide resistance.
CC Insecticidal <i>Bacillus thuringiensis</i> proteins.	XX	OS Synthetic.
CC Claim 39; Page 401-403; 512pp; English.	XX	OS <i>Bacillus thuringiensis</i> .
CC PT 1999-395184/33.	XX	XX
PS PT Insecticidal <i>Bacillus thuringiensis</i> proteins.	XX	PN WO931248-A1.
PS Page 401-403; 512pp; English.	XX	PD 24-JUN-1999.
XX	XX	XX
CC AAY23172-Y23206, and AAX23208-X23209 represent new <i>Bacillus thuringiensis</i> Cry3Bb mutant proteins. The specification also describes methods of altering <i>Bacillus thuringiensis</i> Cry3Bb. The <i>B. thuringiensis</i> Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAV23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte) respectively. The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.	XX	PD 24-JUN-1999.
CC Sequence 652 AA;	XX	XX
CC Query Match 99.8%; Score 3400; DB 26; Length 652;	XX	PF 17-DEC-1998;
CC Best Local Similarity 99.7%; Pred. No. 2, 4e-27;	XX	PF 98WO-US026852.
CC Matches 650; Conservative 1; Mismatches 1; Indels 0; Gaps 0;	XX	PR 18-DEC-1997; 97US-00993170.
QY 1 MNPNRNSEDDTIKTPNSLQTNHQNPADNPNSTLRELNYKEFLMTEDSSTEVLDS 60	DB 1 MNPNRNSEDDTIKTPNSLQTNHQNPADNPNSTLRELNYKEFLMTEDSSTEVLDS 60	PR 18-DEC-1997; 97US-00993722.
DB 1 MNPNRNSEDDTIKTPNSLQTNHQNPADNPNSTLRELNYKEFLMTEDSSTEVLDS 60	QY 61 TVKDAVGTGISVQGILGVPPAGALTSPYQSLNTWPSADPWFKAQVEVLIDK 120	PR 18-DEC-1997; 97US-00993715.
QY 61 TVKDAVGTGISVQGILGVPPAGALTSPYQSLNTWPSADPWFKAQVEVLIDK 120	DB 61 TVKDAVGTGISVQGILGVPPAGALTSPYQSLNTWPSADPWFKAQVEVLIDK 120	PR 18-DEC-1997; 97US-00996411.
QY 121 KIEEYAKSKALAEIQLGLQNNFEDYVNALNSWKTPSLRSRKSQRDIRELFSQAESHFRN 180	QY 121 KIEEYAKSKALAEIQLGLQNNFEDYVNALNSWKTPSLRSRKSQRDIRELFSQAESHFRN 180	XX
PT Insecticidal <i>Bacillus thuringiensis</i> proteins.	PT Insecticidal <i>Bacillus thuringiensis</i> proteins.	XX

XX	Claim 39; Page 356-358; 512pp; English.	XX	ID AAY23193 standard; protein; 652 AA.
PS		XX	AC AAY23193;
XX		XX	AC AAY23193;
CC	AYA3208-X23209 represent new <i>Bacillus thuringiensis</i> Cry3Bb mutant Proteins. The specification also describes methods of altering <i>Bacillus thuringiensis</i> Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution. The deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AYA3207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, ( <i>Diabrotica undecimpunctata howardi</i> Barber, and <i>Diabrotica virgifera virgifera</i> LeConte) respectively. The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance	DT 24-AUG-1999 (first entry)	
XX	Sequence 652 AA;	XX	XX Amino acid sequence of Cry3Bb 11032 polypeptide.
CC		XX	KW Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm;
CC		XX	KW Diabrotica undecimpunctata howardi Barber; transgenic plant; KW <i>Diabrotica virgifera virgifera</i> LeConte; insecticide resistance.
CC		XX	XX Synthetic.
CC		OS	OS <i>Bacillus thuringiensis</i> .
CC		XX	XX WO9911248-A1.
CC		XX	XX PD 24-JUN-1999.
CC		XX	XX PF 17-DEC-1998; 98WO-US026852.
CC		XX	XX PR 18-DEC-1997; 97US-00993170.
CC		XX	XX PR 18-DEC-1997; 97US-00993722.
CC		XX	XX PR 18-DEC-1997; 97US-00993775.
CC		XX	XX PR 18-DEC-1997; 97US-00993441.
Db	1 MNPNNSSEHDITIKVTPNSELQTNHNYQPLADNPNSTLEELNYKEFLRMTEDSSTEVLDS 60	PA (ECOG-) ECOGEN INC.	PA (MONS ) MONSANTO CO.
Db	1 MNPNNSSEHDITIKVTPNSELQTNHNYQPLADNPNSTLEELNYKEFLRMTEDSSTEVLDS 60	XX	XX
Qy	61 TVKDAVGTISVGQILGVGVPPAGALTIVQSFNTIWSADPKWMAQEVNLIDK 120	English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;	English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;
Qy	61 TVKDAVGTISVGQILGVGVPPAGALTIVQSFNTIWSADPKWMAQEVNLIDK 120	PI Walters RS, Slatin SL, Von Tersch MA, Romano C;	PI Walters RS, Slatin SL, Von Tersch MA, Romano C;
Db	61 TVKDAVGTISVGQILGVGVPPAGALTIVQSFNTIWSADPKWMAQEVNLIDK 120	XX	XX WPI: 1999-395184/33.
Qy	121 KIEEYAKSKALAEQGLQNLQNFDDYNALNSWKKTPSLRSRSQDRIRELFSQAEHSFRN 180	XX	XX PR Insecticidal <i>Bacillus thuringiensis</i> proteins.
Db	121 KIEEYAKSKALAEQGLQNLQNFDDYNALNSWKKTPSLRSRSQDRIRELFSQAEHSFRN 180	XX	XX
Qy	181 SMPSFAVSKFEVLFPLTYQAQANTHLLILQKAQVEFGEWGSSEDVAEFTYRQLKLQQY 240	XX	XX AAY23172-Y23206, and AAY23208-X23209 represent new <i>Bacillus thuringiensis</i> Cry3Bb mutant Proteins. The specification also describes methods of altering <i>Bacillus thuringiensis</i> Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially southern corn rootworm and western corn root worm, ( <i>Diabrotica undecimpunctata howardi</i> Barber, and <i>Diabrotica virgifera virgifera</i> LeConte respectively). The mutant cry3Bb Polynucleotides can also be used to produce transgenic plants with increased insecticide resistance
Db	181 SMPSFAVSKFEVLFPLTYQAQANTHLLILQKAQVEFGEWGSSEDVAEFTYRQLKLQQY 240	CC	CC
Qy	241 TDHCWNVNNGLNGLRSTYDIAWKEFNREREMTILTVLDLIVLFPPYDILYSKGYKTEL 300	CC	CC
Db	241 TDHCWNVNNGLNGLRSTYDIAWKEFNREREMTILTVLDLIVLFPPYDILYSKGYKTEL 300	CC	CC
Qy	241 TDHCWNVNNGLNGLRSTYDIAWKEFNREREMTILTVLDLIVLFPPYDILYSKGYKTEL 300	CC	CC
Db	241 TDHCWNVNNGLNGLRSTYDIAWKEFNREREMTILTVLDLIVLFPPYDILYSKGYKTEL 300	CC	CC
Qy	301 TRDIFTDPFSINTLQYGPPTLISIENSRKPHFDYLOGEFEHTPLQGYFKGDSFNYW 360	CC	CC
Db	301 TRDIFTDPFSINTLQYGPPTLISIENSRKPHFDYLOGEFEHTPLQGYFKGDSFNYW 360	CC	CC
Qy	361 SGNYVETRPSIGSSKSKITSPFYGDKSTEPVQKLISFDQGKVTIANTDVAWNGKRYLG 420	CC	CC
Db	361 SGNYVETRPSIGSSKSKITSPFYGDKSTEPVQKLISFDQGKVTIANTDVAWNGKRYLG 420	CC	CC
Qy	421 VTKVDFEQYDQKNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPLEKAYSHOLNYA 480	CC	CC
Db	421 VTKVDFEQYDQKNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPLEKAYSHOLNYA 480	CC	CC
Qy	481 CPMQDRGTTIPFPTWTHRSVDFENTDAEKITOLPVKVALSSGASIEBGPFTGGNL 540	XX	XX Sequence 652 AA;
Db	481 CPMQDRGTTIPFPTWTHRSVDFENTDAEKITOLPVKVALSSGASIEBGPFTGGNL 540	DB	DB 99.8%; Score 3399; DB 2; Length 652;
Qy	541 LPLKESSNSIAKEFKVTLNSAALLORYRVRIRYASTTNLRLFVONSNNDFLYIINKTMNK 600	DB	DB Best Local Similarity 99.8%; Pred. No. 2.9e-276; Mismatches 651; Conservative 0; Indels 0; Gaps 0;
Db	541 LPLKESSNSIAKEFKVTLNSAALLORYRVRIRYASTTNLRLFVONSNNDFLYIINKTMNK 600	DB	DB 1 MNPNNSSEHDITIKVTPNSELQTNHNYQPLADNPNSTLEELNYKEFLRMTEDSSTEVLDS 60
Qy	541 DDDLTQYDPLATTSNSHMGFSKNEIILIGAESFSNEKEIYDKEIIPVQL 652	Qy	Qy 61 TVKDAVGTISVGQILGVGVPPAGALTIVQSFNTIWSADPKWMAQEVNLIDK 120
Db	601 DDDLTQYDPLATTSNSHMGFSKNEIILIGAESFSNEKEIYDKEIIPVQL 652	Db	Db 1 MNPNNSSEHDITIKVTPNSELQTNHNYQPLADNPNSTLEELNYKEFLRMTEDSSTEVLDS 60
Qy	601 DDDLTQYDPLATTSNSHMGFSKNEIILIGAESFSNEKEIYDKEIIPVQL 652	Qy	Qy 61 TVKDAVGTISVGQILGVGVPPAGALTIVQSFNTIWSADPKWMAQEVNLIDK 120
Db	601 DDDLTQYDPLATTSNSHMGFSKNEIILIGAESFSNEKEIYDKEIIPVQL 652	Db	Db 121 KIEEYAKSKALAEQGLQNLQNFDDYNALNSWKKTPSLRSRSQDRIRELPSQAEHSFRN 180
			RESULT 15 AYA23193

QY	181 SMPSPAVSKPEBVLFPLPTYAQAANTHLLKDAQVFGEEWGYSSVEDVAEFTYHQLKLTOY 240	PS	Claim 39; Page 418-420; 512pp; English.
Db	181 SMPSPAVSKPEBVLFPLPTYAQAANTHLLKDAQVFGEEWGYSSVEDVAEFTYHQLKLTOY 240	XX	AAV23172-Y22206, and AAX23208-X23209 represent new <i>Bacillus thuringiensis</i> CC Cry3Bb mutant proteins. The specification also describes methods of CC altering <i>Bacillus thuringiensis</i> Cry3Bb. The B. thuringiensis Cry3Bb CC polypeptide was modified to have improved insecticidal activity or CC enhanced insecticidal specificity against a target insect. The CC modification comprises at least one amino acid substitution, or CC deletion in the primary sequence of the native or unmodified Cry3Bb CC polypeptide, wherein the substitution or deletion occurs at a position CC corresponding to from about amino acids 1-365 of the unmodified CC polypeptide sequence (AAV22207 represents the wild type Cry3Bb protein). CC The polypeptide can be used to kill coleopteran pests, especially by CC application to the environment. It is especially useful against southern CC corn rootworm and western corn root worm. (Diabrotica undecimpunctata CC howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). CC The mutant cry3Bb polynucleotides can also be used to produce transgenic CC plants with increased insecticide resistance.
QY	241 TDHCYVNWYVGLNGLRGSTYDAWYKFNRFREMILTVLQLIVLFFYDLYSKGVKTEL 300	XX	
Db	241 TDHCYVNWYVGLNGLRGSTYDAWYKFNRFREMILTVLQLIVLFFYDLYSKGVKTEL 300		
QY	301 TRDIFTDPFISLNLQEXKPTFELSTNSRKPHIFDYLQGIEPFTRLQGYFSDSENYW 360	Qy	1 MNPNRSEHDITKVTPNSELQINHNQYPLADNINSTEELNTYKFELRNTEDSSTEVLDS 60
Db	301 TRDIFTDPFISLNLQEXKPTFELSTNSRKPHIFDYLQGIEPFTRLQGYFSDSENYW 360	Db	1 MNPNRSEHDITKVTPNSELQINHNQYPLADNINSTEELNTYKFELRNTEDSSTEVLDS 60
QY	361 SGNYVETRDSIGSSKTTSPYGDKSTEVKLSPDGQVYRITANTDAWPNKGVTLG 420	Qy	61 TVKDAVGTGISIVYQGQILGVPGFAGALTTSFYOSFNLNTWPSDADPKAFMAQVEVLIDK 120
Db	361 SGNYVETRDSIGSSKTTSPYGDKSTEVKLSPDGQVYRITANTDAWPNKGVTLG 420	Db	61 TVKDAVGTGISIVYQGQILGVPGFAGALTTSFYOSFNLNTWPSDADPKAFMAQVEVLIDK 120
QY	421 VTKVDFSQDDQNETSTQYDSKRNNGVSAQDSIDQQPETTDEPLEKAYSHQLNAYE 480	Qy	121 KIEBYAKSKAKLQLQGLNNFEDYVNALNSWKCTPLSRSKRSQDTRLEFSQAEHSPRN 180
Db	421 VTKVDFSQDDQNETSTQYDSKRNNGVSAQDSIDQQPETTDEPLEKAYSHQLNAYE 480	Db	121 KIEBYAKSKAKLQLQGLNNFEDYVNALNSWKCTPLSRSKRSQDTRLEFSQAEHSPRN 180
QY	541 LFLKESSNSIAKFKYTLNSALLORYRFAIRYASTTNLFLVQNSNNDELVLYINKTMNK 600	Qy	181 SMPSPAVSKPEBVLFPLPTAQANTHLLKDAQVFGEEWGYSSEDVAEFTYHQLKLTOY 240
Db	541 LFLKESSNSIAKFKYTLNSALLORYRFAIRYASTTNLFLVQNSNNDELVLYINKTMNK 600	Db	181 SMPSPAVSKPEBVLFPLPTAQANTHLLKDAQVFGEEWGYSSEDVAEFTYHQLKLTOY 240
QY	601 DDDLTYQTDFLATTNSNMGSFDKNELEITGAESVSNEKIXYDKEFIPVQL 652	Qy	241 TDHCVNVYVGLNGLRGSTYDAWVFKNFNRREMILTVLQLIVLFFYDLYSKGVKTEL 300
Db	601 DDDLTYQTDFLATTNSNMGSFDKNELEITGAESVSNEKIXYDKEFIPVQL 652	Db	241 TDHCVNVYVGLNGLRGSTYDAWVFKNFNRREMILTVLQLIVLFFYDLYSKGVKTEL 300
QY	RESUL 16	Qy	301 TRDIFTDPIFSLNLQEXYQGPTFELSIENSIRKPHIFDYLQGIEPTLRLQGYFSDSENYW 360
AAV23198	AAV23198 standard; protein; 652 AA.	Db	301 TRDIFTDPIFSLNLQEXYQGPTFELSIENSIRKPHIFDYLQGIEPTLRLQGYFSDSENYW 360
ID	AAV23198	Qy	361 SGNYVETRPSIGSSKTTSPFPYGDKSTEVPQKLSFPGKQVYRTANTDAWPNKGVTLG 420
XX	AAV23198;	Db	361 SGNYVETRPSIGSSKTTSPFPYGDKSTEVPQKLSFPGKQVYRTANTDAWPNKGVTLG 420
AC		Qy	421 VTKVDFSQDDQNETSTQYDSKRNNGVSAQDSIDQQPETTDEPLEKAYSHQLNAYE 480
XX	24-AUG-1999 (first entry)	Db	421 VTKVDFSQDDQNETSTQYDSKRNNGVSAQDSIDQQPETTDEPLEKAYSHQLNAYE 480
XX	Amino acid sequence of Cry3Bb.11051 polypeptide.	Qy	541 LFLKESSNSIAKPKVTLNSAALLQYRVRVASTNLFLVQNSNNDFLVYINKTMNK 600
DE		Db	541 LFLKESSNSIAKPKVTLNSAALLQYRVRVASTNLFLVQNSNNDFLVYINKTMNK 600
KW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity;	Qy	481 CIPMQDRGTRTIPFTWHSRDFNNTDAEKITQPLPVYKAYALSQASIIIEGFFGFTGNL 540
KW	coleoptera; southern corn rootworm; western corn root worm;	Db	481 CIPMQDRGTRTIPFTWHSRDFNNTDAEKITQPLPVYKAYALSQASIIIEGFFGFTGNL 540
KW	Diabrotica undecimpunctata howardi Barber; transgenic plant;	Qy	
KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.	Db	
XX	Synthetic.	Qy	
OS	<i>Bacillus thuringiensis</i> .	Db	
XX	W09931248-A1.	Qy	
XX	24-JUN-1999.	Db	
PD	24-JUN-1999.	Qy	
XX	17-DEC-1998; 98W0-US026852.	Db	
PF		Qy	
XX	18-DEC-1997; 97W0-US09931170.	Db	
PR	18-DEC-1997; 97W0-US09937722.	Qy	
PR	18-DEC-1997; 97W0-US0993775.	Db	
PR	18-DEC-1997; 97W0-US0996441.	Qy	
XX	(ECOG-) ECOGEN INC. (MONSANTO CO.	Db	
PA		Qy	
XX	English L, Brusseock SM, Malvar TM, Bryson JW, Kulesza CA;	Db	
PI		Qy	
PI	Walters FS, Slatkin SL, von Tersch MP, Romano C;	Db	
XX	WPP; 1999-395184/33.	Qy	
XX	PT Insecticidal <i>Bacillus thuringiensis</i> proteins.	Db	
XX		RESULT 17	
ID	AAV23175		
ID	AAV23175 standard; protein; 652 AA.		

XX	AY23175;	181	SMPSPAVSKPBPVLFPLPTYAQAAANTHLLKDAQVFGEEWYSSSEDAEFPYHRQLKLTQQY	240	
AC		181	SMPSPAVSKPBPVLFPLPTYAQAAANTHLLKDAQVFGEEWYSSSEDAEFPYHRQLKLTQQY	240	
XX	24-AUG-1999 (First entry)	Qy	241	TDHCYCNWYNGLNGLGSYDAWTKFNRFRREMILTVLDLIVLPFYDIRLYSKGKVKTEL	300
XX	Amino acid sequence of Cry3Bb.11224 polypeptide.	Db	241	TDHCYCNWYNGLNGLGSYDAWTKFNRFRREMILTVLDLIVLPFYDIRLYSKGKVKTEL	300
DE		Qy	301	TRDIDTPPIESINTLQEQGPTELSIENSIRKPHFLDYLQGIEFTRLQPGYFGKDSFNTW	360
XX	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm;	Db	301	TRDIDTPPIESINTLQEQGPTELSIENSIRKPHFLDYLQGIEFTRLQPGYFGKDSFNTW	360
KW	Diabrotica undecimpunctata howardi Barber; transgenic plant;	Qy	361	SGNYVETRPSIGSSKTTITSFPGKSTKTEPVQLSPDQGYRTIANTDVAAPNCKAYVLG	420
KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.	Db	361	SGNYVETRPSIGSSKTTITSFPGKSTKTEPVQLSPDQGYRTIANTDVAAPNCKAYVLG	420
XX	Synthetic.	Qy	421	VTKVDFSYQDDQKNETSTQYDTSKRNGHVSQDSIDQLPETTDEPLEKAYSHQLYNAYE	480
OS	Bacillus thuringiensis.	Db	421	VTKVDFSYQDDQKNETSTQYDTSKRNGHVSQDSIDQLPETTDEPLEKAYSHQLYNAYE	480
XX	W09931248-A1.	Qy	481	CFLMMDRRGTRGTPFPTWTHRSVDFPNTIDAKITOLPVVAKAYALSSGAS11EFGPFGGNL	540
PN		Db	481	CFLMMDRRGTRGTPFPTWTHRSVDFPNTIDAKITOLPVVAKAYALSSGAS11EFGPFGGNL	540
XX	24-JUN-1999.	Qy	541	LFLKESSNS1AKEVTTINSALLQYRVRVRYASTNLRLFVQNSNDLFLVYIYNTMKN	600
PD		Db	541	LFLKESSNS1AKEVTTINSALLQYRVRVRYASTNLRLFVQNSNDLFLVYIYNTMKN	600
XX	17-DEC-1998;	Qy	601	DDDLTYQTDFIATINSNMGFSGDKNELIGAESFVSNEKIYDKEFIPVQL	652
PF	98WO-US026852.	Db	601	DDDLTYQTDFIATINSNMGFSGDKNELIGAESFVSNEKIYDKEFIPVQL	652
XX	18-DEC-1997;	PR	PA (ECOG ) ECOGEN INC.		
PR	97US-00993170.	PR	(MONS ) MONSANTO CO.		
PR	18-DEC-1997;	PR	English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;		
PR	97US-00993722.	PR	Walters FS, Statin SL, von Tersch MA, Romano C;		
PR	18-DEC-1997;	PR	DR; 1999-395184/33.		
PR	97US-00993775.	PT	Insecticidal Bacillus thuringiensis proteins.		
PR	18-DEC-1997;	PS	Claim 39; Page 289-291; 512pp; English.		
PR	97US-00996441.	XX	AY23172-Y23206, and AAX23208-X23209 represent new Bacillus thuringiensis Cry3Bb mutant proteins. The specification also describes methods of altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against target insect. The modification comprises at least one amino acid substitution, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm. (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.		
PA		XX	Sequence 652 AA;		
PA		XX	Query Match 99.8%; Score 3398; DB 2; Length 652;		
PA		XX	Best Local Similarity 99.8%; Pred. No. 3-6e-276;		
PA		XX	Matches 651; Conservative 0; Mismatches 1; Indels 0; Gaps 0;		
Qy	1	1	MNPNNRSEHDITKVTPNSELQTNHQPLADPNSTLEELNYKEPLMTEDSSTEVLDNS	60	
Db	MNPNNRSEHDITKVTPNSELQTNHQPLADPNSTLEELNYKEPLMTEDSSTEVLDNS	60	PA (ECOG ) ECOGEN INC.		
Qy	61	TYKDAVGTVGTSVWQGQILGVGVFPAGALTFSYQFSINTIWPSDADPMKAQVEVLIDK	120	PA (MONS ) MONSANTO CO.	
Db	TYKDAVGTVGTSVWQGQILGVGVFPAGALTFSYQFSINTIWPSDADPMKAQVEVLIDK	120	XX	English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;	
Qy	121	KTBEYAKSKAKAELQGQNFFEDYXNALNSWCKTPSLRSRQSDTIRELFSQAEHFRN	180	PI Walters FS, Statin SL, von Tersch MA, Romano C;	
Db	KTBEYAKSKAKAELQGQNFFEDYXNALNSWCKTPSLRSRQSDTIRELFSQAEHFRN	180	XX	Insecticidal Bacillus thuringiensis proteins	
Qy	121	PT	Claim 39; Page 339-342; 512pp; English.		
Db		PS			

XX AAY23172-Y23206, and AAY23208-X23209 represent new *Bacillus thuringiensis* CC Cry3Bb mutant proteins. The specification also describes methods of altering *Bacillus thuringiensis* Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (*Diabrotica undecimpunctata howardi* Barber, and *Diabrotica virgifera virgifera* LeConte) respectively. The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance

XX Sequence 652 AA;

Query Match 99.8%; Score 3398; DB 2; Length 652;  
Best Local Similarity 99.7%; Pred. No. 3.5e-27; Indels 0; Gaps 0;  
Matches 650; Conservative 1; Mismatches 1;

Db 1. MNPNNRSEHDTIKVTPNSFLQTNHNOYIADNPNSTLLELNKEFLMTEDSSTEVLDNS 60  
Qy 1. MNPNNRSEHDTIKVTPNSFLQTNHNOYIADNPNSTLLELNKEFLMTEDSSTEVLDNS 60

Db 61. TVKDAVGTCISVQGIVPGPAGALTFSYQSFLNTIWPSPADPKMAQMVEVLIDK 120  
Qy 61. TVKDAVGTCISVQGIVPGPAGALTFSYQSFLNTIWPSPADPKMAQMVEVLIDK 120

Db 61. TVKDAVGTCISVQGIVPGPAGALTFSYQSFLNTIWPSPADPKMAQMVEVLIDK 120  
Qy 121. KIEBYAKSKALAEIQLQLNINFEDYVNAISWKTPLSLRSKRSQDRIRELFSQAESFRN 180  
Db 121. KIEBYAKSKALAEIQLQLNINFEDYVNAISWKTPLSLRSKRSQDRIRELFSQAESFRN 180

Db 181. SMPSFAVSKFEVLFLPTYAQANTHLLIKDAQVYFGEMWGYSSEDVAEYFHQLKLTQCY 240  
Qy 181. SMPSFAVSKFEVLFLPTYAQANTHLLIKDAQVYFGEMWGYSSEDVAEYFHQLKLTQCY 240

Db 181. SMPSFAVRFEVFLFLPTYAQANTHLLIKDAQVYFGEMWGYSSEDVAEYFHQLKLTQCY 240  
Qy 241. TDHCVNWTNGLNLGRGSTDYDVKENFRREMTLTLDLIVLFPFDYDRLISLKGVKTTEL 300  
Db 241. TDHCVNWTNGLNLGRGSTDYDVKENFRREMTLTLDLIVLFPFDYDRLISLKGVKTTEL 300

Db 301. TRDIFTDPFLSLNLTQEQYQPTPLSIENSIRKPHLFDYDQGIEFHTRIQLQGYFGKDSFNYW 360  
Qy 301. TRDIFTDPFLSLNLTQEQYQPTPLSIENSIRKPHLFDYDQGIEFHTRIQLQGYFGKDSFNYW 360

Db 361. SGNYVETRSIGSSKTTSPYQGKDSKTRPVQLSFDGOKVYRTIANTDVAAPNGKTYLG 420  
Qy 361. SGNYVETRSIGSSKTTSPYQGKDSKTRPVQLSFDGOKVYRTIANTDVAAPNGKTYLG 420

Db 421. VTKVDFSQYDQKNETSTQYD5KRNNCHVSAQSDIDOLPPTTDEPLEKAYSHOLNVAE 480  
Qy 421. VTKVDFSQYDQKNETSTQYD5KRNNCHVSAQSDIDOLPPTTDEPLEKAYSHOLNVAE 480

Db 481. CFLMDQRRTIPPFETWHRSDFFNT1DAEKITQLPVYKAYAASSGASIIEGPGFTGQNL 540  
Qy 481. CFLMDQRRTIPPFETWHRSDFFNT1DAEKITQLPVYKAYAASSGASIIEGPGFTGQNL 540

Db 541. LFLKESSNSIAKFKVTLNSAALLQRYVRVYASTTMNLRFYONSNNDFLVYINKTMNK 600  
Db 541. LFLKESSNSIAKFKVTLNSAALLQRYVRVYASTTMNLRFYONSNNDFLVYINKTMNK 600

Db 601. DDDLTQTFDLATNSNMGFSGDKNELIIGAESPVNSNEKIVYDKEFIPVQL 652  
Db 601. DDDLTQTFDLATNSNMGFSGDKNELIIGAESPVNSNEKIVYDKEFIPVQL 652

Qy 601. DDDLTQTFDLATNSNMGFSGDKNELIIGAESPVNSNEKIVYDKEFIPVQL 652  
Db 601. DDDLTQTFDLATNSNMGFSGDKNELIIGAESPVNSNEKIVYDKEFIPVQL 652

Qy 121. KIEBEYAKSKALAEIQLQNNFEDYVNAISWKTPLSLRSKRSQDRIRELFSQAESFRN 180  
Db 121. KIEBEYAKSKALAEIQLQNNFEDYVNAISWKTPLSLRSKRSQDRIRELFSQAESFRN 180

Qy 181. SMPSFAVSKFEVLFLPTYAQANTHLLIKDAQVYFGEMWGYSSEDVAEYFHQLKLTQCY 240

Db	181	SMPFSVSKFEVFLFLPTYAQAANTHILLLKDQVGEWGSSVEDAEFYRQLKLQTQY	24
Qy	241	TDHCVNNVNGLNGLRGSTYDAWKVNFRFRRENTLTVLFLIVLFFPFDIYLSSKGVKTB	30
Db	241	TDHCVNNVNGLNGLRGSTYDAWKVNFRFRRENTLTVLFLIVLFFPFDIYLSSKGVKTB	30
Qy	301	TRDIFTDPIFSLNTLQEOYGPFTPSIENSIRKPHLFDYLGQIEFHTRLQGPYFGKDSFNYW	36
Db	301	TRDIFTDPIFSLNTLQEOYGPFTPSIENSIRKPHLFDYLGQIEFHTRLQGPYFGKDSFNYW	36
Qy	361	SGNYVEIRPSIGSSKTTISPFQKSTTPVQKLSFDGQKVRILANTDAAMNGKUYLG	42
Db	361	SGNYVEIRPSIGSSKTTISPFQKSTTPVQKLSFDGQKVRILANTDAAMNGKUYLG	42
Qy	421	VTKVDFSYQDDQNETSTQTYDSKRNNGHVSADSISDQLPETTDEPLEKAYSHOLNAYE	48
Db	421	VTKVDFSYQDDQNETSTQTYDSKRNNGHVSADSISDQLPETTDEPLEKAYSHOLNAYE	48
Qy	481	CFLMQDRRTGTTIPPTWTHRSVDPFFNTDAEKITOLPVVAYAASSGASLIEGPFGFTGNNL	54
Db	481	CFLMQDRRTGTTIPPTWTHRSVDPFFNTDAEKITOLPVVAYAASSGASLIEGPFGFTGNNL	54
Qy	541	LFLKESSNSIAKPKVTLNSAALIORYRVRIRYASTTNLRLFVQNSNNDFIVIYINKTMNK	60
Db	541	LFLKESSNSIAKPKVTLNSAALIORYRVRIRYASTTNLRLFVQNSNNDFIVIYINKTMNK	60
Qy	601	DDDLITYQTFDPLATTNSNMGFSGDKNELIGAESFSVNEKLYIDKLEFIPVQL	652
Db	601	DDDLITYQTFDPLATTNSNMGFSGDKNELIGAESFSVNEKLYIDKLEFIPVQL	652
RESULT 20			
	AYA23203	standard; protein; 652 AA.	
	XX		
	AC	AYA23203 ;	
	XX		
	DT	24-AUG-1999 (first entry)	
	XX		
	DE	Amino acid sequence of Cry3Bb.11083 polypeptide.	
	XX		
	KW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity;	
	KW	coleoptera; southern corn rootworm; western corn root worm;	
	KW	Diabrotica undecimpunctata howardi Barber; transgenic plant;	
	KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.	
	XX		
	OS	Synthetic.	
	OS	Bacillus thuringiensis.	
	XX		
	PN	W0931248-A1.	
	XX		
	PD	24-JUN-1999.	
	XX		
	PF	17-DEC-1998 ;	98WO-US026952.
	XX		
	PR	18-DEC-1997 ;	97US-00993170.
	PR	18-DEC-1997 ;	97US-00993122.
	PR	18-DEC-1997 ;	97US-00993775.
	PR	18-DEC-1997 ;	97US-00996441.
	XX		
	PA	(ECOG- ) ECOGEN INC.	
	PA	(MONS ) MONSANTO CO.	
	XX		
	PI	English L, Brussock SM, Malvar TM, Bryson JW, Kulesza CA;	

WPI; 1999-395184/33.  
Insecticidal *Bacillus thuringiensis* proteins.  
Claim 39; Page 446-448; 512pp; English.  
RESULT 21  
AAV23177  
ID AAV23177 standard; protein; 652 AA.  
XX  
AC AAV23177:

XX	24-AUG-1999	(First entry)	Db	181 SMPSFAVKSEFVLFPLTYQAQANTHLLLKDQVFGEMGSSEDVAFFYTRQLKLTQOY 240
XX		Amino acid sequence of Cry3Bb.11226 polypeptide.	QY	241 TDICVNVNVGLNGRLGSTDYDAVVKFNRERMTLTVLDLIVIFPFYDRLYSKGVKTEL 300
DE			Db	241 TDICVNVNVGLNGRLGSTDYDAVVKFNRERMTLTVLDLIVIFPFYDRLYSKGVKTEL 300
KW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm;		QY	301 TROITDPFLSNTLQEQYQPTFUSIENSIRKPLFDYLGIEFHTRLQPGYFGKDSFNYW 360
KW	Diabrotica undecimpunctata howardi Barber; transgenic plant;		Db	301 TROITDPFLSNTLQEQYQPTFUSIENSIRKPLFDYLGIEFHTRLQPGYFGKDSFNYW 360
KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.		QY	361 SGNYVETPSIGSSKTTSPFYGKDSFPQKLUSFDGKVRYTANTDVAAWNGKYLG 420
XX			Db	361 SGNYVETPSIGSSKTTSPFYGKDSFPQKLUSFDGKVRYTANTDVAAWNGKYLG 420
OS	Bacillus thuringiensis.		QY	421 VTKVDFSOYDDDKNETSTQTYDSKRNNGHVSAAQSDSIDOLPPETTDEPLEKAYSHOLNAYE 480
XX	WO9931248-A1.		Db	421 VTKVDFSOYDDDKNETSTQTYDSKRNNGHVSAAQSDSIDOLPPETTDEPLEKAYSHOLNAYE 480
PD	24-JUN-1999.		QY	481 CTFMQDRGTTIPPFWTHRSVDFPNTIDAEKITOLPYKAYALSGASILIEGPGPTGGNL 540
XX	17-DEC-1998;	98WO-US026852.	Db	481 CTFMQDRGTTIPPFWTHRSVDFPNTIDAEKITOLPYKAYALSGASILIEGPGPTGGNL 540
PF			QY	541 LFLKESSNSIAKEPKVTLNSAALLQYRVRIRYASTNTNLFVQNSNDFLVYINKTMNK 600
XX	18-DEC-1997;	97US-00993170.	Db	541 LFLKESSNSIAKEPKVTLNSAALLQYRVRIRYASTNTNLFVQNSNDFLVYINKTMNK 600
PR	18-DEC-1997;	97US-00993722.	QY	601 DDDLYXOTFDLATTNSNMGFSGDKNELIGAESFSNEKIIDKIEFIPVOL 652
PR	18-DEC-1997;	97US-00993775.	Db	601 DDDLYXOTFDLATTNSNMGFSGDKNELIGAESFSNEKIIDKIEFIPVOL 652
PR	18-DEC-1997;	97US-00996441.		
XX				
(ECOG-)	ECOGEN INC.			
PA	(MONS ) MONSANTO CO.			
XX	English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;			
PI	Walters FS, Slatkin SL, Von Tersch MA, Romano C;			
XX	WPI; 1999-395184/3.			
DR				
XX	Insecticidal Bacillus thuringiensis proteins.			
XX	Claim 39; Page 300-302; 512pp; English.			
PS			XX	AAV23176 standard; protein; 652 AA.
XX			AC	AAY23176;
CC	AAV23172-Y23206, and AAX23208-X23209 represent new Bacillus thuringiensis Cry3Bb mutant proteins. The specification also describes methods of altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAV2207 represents the wild type Cry3Bb protein).		XX	24-AUG-1999 (first entry)
CC	The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte respectively).		DE	Amino acid sequence of Cry3Bb.11225 polypeptide.
CC	The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.		XX	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; Diabrotica virgifera virgifera LeConte; insecticide resistance.
CC			XX	Synthetic.
CC			OS	Bacillus thuringiensis.
CC			XX	W09931248-A1.
CC			XX	
CC			PD	24-JUN-1999.
CC			XX	98WO-US026852.
SQ	Sequence 652 AA;		XX	
Query	Match	99.7%; Score 3396; DB 26; Length 652;	XX	
Best Local	Similarity	Pred. No. 5.1e-27;	PR	18-DEC-1997; 97US-00993170.
Matches	651; Conservative	0; Mismatches 1; Indels 0; Gaps 0;	PR	18-DEC-1997; 97US-00993722.
Qy	1	MNPNNRSEHDITKVTPNSELQTNHQYPLADNPNSTLLELNKEFLMTEDSSTEVLDSN 60	PR	18-DEC-1997; 97US-00993775.
Db	1	MNPNNRSEHDITKVTPNSELQTNHQYPLADNPNSTLLELNKEFLMTEDSSTEVLDSN 60	XX	18-DEC-1997; 97US-00996441.
Qy	61	TVKDAVGTCISVQGQPLQGQVGPAGALTSTFOSFLNTIWPSPADPKAFMAQVEVLIDK 120	XX	
Db	61	TVKDAVGTCISVQGQPLQGQVGPAGALTSTFOSFLNTIWPSPADPKAFMAQVEVLIDK 120	XX	
Qy	121	KIEBYAKSKALAEQGLQMNFDYVNALNSWKTPLSRSKRSQDRTRLEQAEQSHFRN 180	XX	
Db	121	KIEBYAKSKALAEQGLQMNFDYVNALNSWKTPLSRSKRSQDRTRLEQAEQSHFRN 180	XX	
Qy	181	SMPSPAVKSEFVLFPLTYQAQANTHLLLKDQVFGEMGSSEDVAFFYHQLKLTQOY 240	XX	
Db			XX	Claim 39; Page 294-297; 512pp; English.
Qy			CC	AAY23172-Y23206, and AAX23208-X23209 represent new Bacillus thuringiensis proteins.



Qy	241	TDHCYVNWYVGLNGLRGSTDYAWTKENRFRREMTLTVLFLPFYDRLYSKGVKTEL	300	CC altering <i>Bacillus thuringiensis</i> Cry3Bb. The <i>B. thuringiensis</i> Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAV23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howard Barber, and Diabrotica virgifera vergifera LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance
Db	241	TDHCYVNWYVGLNGLRGSTDYAWTKENRFRREMTLTVLFLPFYDRLYSKGVKTEL	300	XX
Qy	301	TRDIFTDPFSLNLTLQEQYGPFTLSENSLRKPHLFDTYDLYGIEFHTRLQGYFQKDSFNYW	360	CC
Db	301	TRDIFTDPFILHLTLQEQYGPFTLSENSLRKPHLFDTYDLYGIEFHTRLQGYFQKDSFNYW	360	CC
Qy	361	SGNTVETRSGSSTTITPFYGDKSTEVQKLSFDGQYRTANTDAAWNGKTYLG	420	CC
Db	361	SGNTVETRSGSSTTISPFYGDKSTEVQKLSFDGQYRTANTDAAWNGKTYLG	420	CC
Qy	421	VTKYDFSQDDQNETSTQYDSDKRNGHVSQAQSDTQDQPPETDDEPLKAYSHQLYNAE	480	CC
Db	421	VTKYDFSQDDQNETSTQYDSDKRNGHVSQAQSDTQDQPPETDDEPLKAYSHQLYNAE	480	CC
Qy	481	CFLMDQRRTGTPFPTWHSVDFNTIDAKITQLPVVAIALSGASTIEGFGFTGQNL	540	CC
Db	481	CFLMDQRRTGTPFPTWHSVDFNTIDAKITQLPVVAIALSGASTIEGFGFTGQNL	540	CC
Qy	541	LFLKESSNSLAKEFKVTLNSALLORYVRVIRYASTTNLFLVONSNNDELVITYINKTMNK	600	CC
Db	541	LFLKESSNSLAKEFKVTLNSALLORYVRVIRYASTTNLFLVONSNNDELVITYINKTMNK	600	CC
Qy	601	DDDLTYQTPLATINNSMGFSGDKNEELIGAESFVSNEKIIDKIEFIPVQL	652	CC
Db	601	DDDLTYQTPLATINNSMGFSGDKNEELIGAESFVSNEKIIDKIEFIPVQL	652	CC
RESULT 24				
ID	AAV23181	AAV23181 standard; protein; 652 AA.		
AC	AAV23181;			
DB	24-AUG-1999	(first entry)		
DE	Amino acid sequence of Cry3Bb.111230 polypeptide.			
DE	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howard Barber; transgenic plant; Diabrotica virgifera vergifera LeConte; insecticide resistance.			
OS	Synthetic.			
OS	<i>Bacillus thuringiensis</i> .			
XX	W09931248-A1.			
PN	24-JUN-1999.			
PD	17-DEC-1998; 98WO-US026852.			
XX	18-DEC-1997; 97US-00933170.			
PR	18-DEC-1997; 97US-0093722.			
PR	18-DEC-1997; 97US-0093775.			
PR	18-DEC-1997; 97US-00936441.			
PA	(ECOG-) ECOGEN INC.			
PA	(MONS ) MONSANTO CO.			
XX	English L, Bruscock SM, Malvar TM, Bryson JW, Kulesza CA, Walters FS, Slatkin SL, von Tersch MA, Romano C, DR WPI: 1999-395184/33.			
XX	Insecticidal <i>Bacillus thuringiensis</i> proteins.			
XX	Claim 39; Page 322-325; 512pp; English.			
PS	AAV23172-Y23206, and AAV23208-X23209 represent new <i>Bacillus thuringiensis</i> Cry3Bb mutant proteins. The specification also describes methods of			
XX	DT 24-AUG-1999 (first entry)			
RESULT 25				
ID	AAV23204	AAV23204 standard; protein; 652 AA.		
XX	AAV23204;			
AC	AAV23204;			
XX	DT 24-AUG-1999			



CC polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The CC modification comprises at least one amino acid substitution. The CC deletion in the primary sequence of the native or unmodified Cry3Bb CC polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified CC polypeptide sequence (AY23207 represent the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance

Sequence 652 AA;

Query Match 99.6%; Score 332; DB 2; Length 652;  
Best Local Similarity 99.5%; Pred. No. 1..1e-275;  
Matches 649; Conservative 2; Mismatches 1; Indels 0; Gaps 0;  
Qy 1 MNPNRSEHDITKVTPNSLQTNHQYQPLADNPNSTLBLEINYKEFLRMTEDSSTEVLDS 60  
Db 1 MNPNRSEHDITKVTPNSLQTNHQYQPLADNPNSTLBLEINYKEFLRMTEDSSTEVLDS 60  
Qy 61 TVKDAVGTCGTSVVGQIQLGVGVPPFAGALTFSYQSLNTWPSDADPKAFMAQVEVLDK 120  
Db 61 TVKDAVGTCGTSVVGQIQLGVGVPPFAGALTFSYQSLNTWPSDADPKAFMAQVEVLDK 120  
Qy 121 KIEEYAKSKAKAELQGLQNNFEDYNAWSKCKTPLSLRSKRSODRKEELFQSQAEHPRN 180.  
Db 121 KIEEYAKSKAKAELQGLQNNFEDYNAWSKCKTPLSLRSKRSQGRINELFQSQAEHPRN 180  
Qy 181 SMPSPAVSKPFEVLPLPFTAQAAANTHLLLKDQVFGEEWGSSEDVAEYFHROLKLTKQY 240  
Db 181 SMPSPAVSKPFEVLPLPFTAQAAANTHLLLKDQVFGEEWGSSEDVAEYFHROLKLTKQY 240  
Qy 241 TDHCVNNWYNGVLNGLGRGSTDYAWTKFNRPREMTLTVLQDLYLFPFYDRLYSGKVTKEL 300  
Db 241 TDHCVNNWYNGVLNGLGRGSTDYAWTKFNRPREMTLTVLQDLYLFPFYDRLYSGKVTKEL 300  
Qy 301 TRDIFTDPISLNLTLQEQGPTFSLIENSIRKPHLFYDLYQGIEFHTRLQGYFGKDSFNYW 360  
Db 301 TRDIFTDPISLNLTLQEQGPTFSLIENSIRKPHLFYDLYQGIEFHTRLQGYFGKDSFNYW 360  
Qy 361 SGNYVETRISIGSSKTTSPYFGDKSTEVKQKLSDFGQVYRTIANTDAAWPNKGYKLG 420  
Db 361 SGNYVETRISIGSSKTTSPYFGDKSTEVKQKLSDFGQVYRTIANTDAAWPNKGYKLG 420  
Qy 4221 VTKYDFSQYDQNETSTOTYDSKRNNGHVAQDSIDOLPPTTDEPLEKAYSHOLNAYE 480  
Db 4221 VTKYDFSQYDQNETSTOTYDSKRNNGHVAQDSIDOLPPTTDEPLEKAYSHOLNAYE 480  
Qy 481 CFLMDQRRTGTPFPTWTHRSDFPNTIDEKTKTLPVYKAYAASSGASIEGPGFTGQNL 540  
Db 481 CFLMDQRRTGTPFPTWTHRSDFPNTIDEKTKTLPVYKAYAASSGASIEGPGFTGQNL 540  
Qy 541 LFLKESSNSIAKFKVTLNAAALLORYRVRYRASSTNNLFLVQNSNNDFLVLVINKTMNK 600  
Db 541 LFLKESSNSIAKFKVTLNAAALLORYRVRYRASSTNNLFLVQNSNNDFLVLVINKTMNK 600  
Qy 601 DDDLYQTFDLATTSNMGSGDKNEELIGAESFVSNEKLYIDKIEFIPVQL 652  
Db 601 DDDLYQTFDLATTSNMGSGDKNEELIGAESFVSNEKLYIDKIEFIPVQL 652  
RESLT 27  
AAV23186 standard: protein; 652 AA.  
XX AAV23186  
DT 24-AUG-1999 (First entry)

Amino acid sequence of Cry3Bb.11235 polypeptide.

XX Cry3Bb; mutant; insecticidal activity; insecticidal specificity;  
KW Coleoptera; Southern corn rootworm; western corn root worm;  
KW Diabrotica undecimpunctata howardi Barber; transgenic plant;  
KW Synthetica.  
OS Bacillus thuringiensis.  
XX WO931248-A1.  
XX 24-JUN-1999.  
PD XX  
PF 17-DEC-1998; 98WO-US026852.  
XX  
PR 18-DEC-1997; 97US-00993172.  
PR 18-DEC-1997; 97US-00993775.  
PR 18-DEC-1997; 97US-00996441.  
PA (ECOG-) ECOGEN INC.  
PA (MONS) MONSANTO CO.  
XX  
PI English L, Brussock SM, Malvar TM, Bryson JW, Kulesza CA;  
PI Walters FS, Slatin SL, Von Tersch MA, Romano C,  
XX  
DR WPI; 1999-35184/33.  
XX  
PT Insecticidal Bacillus thuringiensis proteins.  
XX  
PS Claim 39; Page 351-353; 512pp; English.  
XX  
CC AAY23172-Y23206, and AAY23208-X23209 represent new *Bacillus thuringiensis* CC Cry3Bb mutant proteins. The specification also describes methods of CC altering *Bacillus thuringiensis* Cry3Bb. The B. thuringiensis Cry3Bb CC polypeptide was modified to have improved insecticidal activity or CC enhanced insecticidal specificity against a target insect. The CC modification comprises at least one amino acid substitution, addition, or CC deletion in the primary sequence of the native or unmodified Cry3Bb CC polypeptide, wherein the substitution or deletion occurs at a position CC corresponding to from about amino acids 1-365 of the unmodified CC polypeptide sequence (AAY23207 represents the wild type Cry3Bb protein). CC The polypeptide can be used to kill coleopteran pests, especially by CC application to the environment. It is especially useful against southern CC corn rootworm and western corn root worm (Diabrotica undecimpunctata CC howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). CC The mutant cry3Bb polynucleotides can also be used to produce transgenic CC plants with increased insecticide resistance  
XX  
SQ Sequence 652 AA;

Query Match 99.6%; Score 3392; DB 2; Length 652;  
Best Local Similarity 99.7%; Pred. No. 1..1e-275;  
Matches 650; Conservative 0; Mismatches 2; Indels 0; Gaps 0;  
Qy 1 MNPNRSEHDITKVTPNSLQTNHQYQPLADNPNSTLBLEINYKEFLRMTEDSSTEVLDS 60  
Db 1 MNPNRSEHDITKVTPNSLQTNHQYQPLADNPNSTLBLEINYKEFLRMTEDSSTEVLDS 60  
Qy 61 TVKDAVGTCGTSVVGQIQLGVGVPPFAGALTFSYQSLNTWPSDADPKAFMAQVEVLDK 120  
Db 61 TVKDAVGTCGTSVVGQIQLGVGVPPFAGALTFSYQSLNTWPSDADPKAFMAQVEVLDK 120  
Qy 121 KIEEYAKSKAKAELQGLQNNFEDYNAWSKCKTPLSLRSKRSODRKEELFQSQAEHPRN 180  
Db 121 KIEEYAKSKAKAELQGLQNNFEDYNAWSKCKTPLSLRSKRSODRKEELFQSQAEHPRN 180  
Qy 181 SMPSPAVSKPFEVLPLPFTAQAAANTHLLKDQVFGEEWGSSEDVAEYFHROLKLTKQY 240  
Db 181 SMPSPAVSKPFEVLPLPFTAQAAANTHLLKDQVFGEEWGSSEDVAEYFHROLKLTKQY 240  
Qy 241 TDHCVNNWYNGVLNGLGRGSTDYAWTKFNRPREMTLTVLQDLYLFPFYDRLYSGKVTKEL 300  
Db 241 TDHCVNNWYNGVLNGLGRGSTDYAWTKFNRPREMTLTVLQDLYLFPFYDRLYSGKVTKEL 300  
Qy 301 TRDIFTDPISLNLTLQEQGPTFSLIENSIRKPHLFYDLYQGIEFHTRLQGYFGKDSFNYW 360  
Db 301 TRDIFTDPISLNLTLQEQGPTFSLIENSIRKPHLFYDLYQGIEFHTRLQGYFGKDSFNYW 360  
Qy 361 SGNYVETRISIGSSKTTSPYFGDKSTEVKQKLSDFGQVYRTIANTDAAWPNKGYKLG 420  
Db 361 SGNYVETRISIGSSKTTSPYFGDKSTEVKQKLSDFGQVYRTIANTDAAWPNKGYKLG 420  
Qy 4221 VTKYDFSQYDQNETSTOTYDSKRNNGHVAQDSIDOLPPTTDEPLEKAYSHOLNAYE 480  
Db 4221 VTKYDFSQYDQNETSTOTYDSKRNNGHVAQDSIDOLPPTTDEPLEKAYSHOLNAYE 480  
Qy 481 CFLMDQRRTGTPFPTWTHRSDFPNTIDEKTKTLPVYKAYAASSGASIEGPGFTGQNL 540  
Db 481 CFLMDQRRTGTPFPTWTHRSDFPNTIDEKTKTLPVYKAYAASSGASIEGPGFTGQNL 540  
Qy 541 LFLKESSNSIAKFKVTLNAAALLORYRVRYRASSTNNLFLVQNSNNDFLVLVINKTMNK 600  
Db 541 LFLKESSNSIAKFKVTLNAAALLORYRVRYRASSTNNLFLVQNSNNDFLVLVINKTMNK 600  
Qy 601 DDDLYQTFDLATTSNMGSGDKNEELIGAESFVSNEKLYIDKIEFIPVQL 652  
Db 601 DDDLYQTFDLATTSNMGSGDKNEELIGAESFVSNEKLYIDKIEFIPVQL 652  
RESLT 27  
AAV23186  
ID AAV23186  
XX AAV23186  
DT 24-AUG-1999 (First entry)

Db	241	TDHCVNWNVNGLNGSTYDAWKENFRFRERMTLTVLDIRYLSKGVTTEL	300	enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution. Addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful, against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance
Qy	301	TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW	360	XX
Db	301	TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW	360	XX
Qy	361	SGNYVETRPSIGSSKTTISPFYGDKSTEPVKLISPFGKVKYRTIANTDVAAPNGKTYLG	420	XX
Db	361	SGNYVETRPSIGSSKTTISPFYGDKSTEPVKLISPFGKVKYRTIANTDVAAPNGKTYLG	420	XX
Qy	421	VTKVDISQYDQKNESTOTVSKRNGHVSQDSDQDLPETTDEPLEKAYSHOLNYAE	480	XX
Db	421	VTKVDISQYDQKNESTOTVSKRNGHVSQDSDQDLPETTDEPLEKAYSHOLNYAE	480	XX
Qy	481	CFLMDQERGTIPFTWTHRSVPFNTDAEKITQTLQVVKAYALSGASITEGPGFTGQNL	540	Sequence 652 AA;
Db	481	CFLMDQERGTIPFTWTHRSVPFNTDAEKITQTLQVVKAYALSGASITEGPGFTGQNL	540	Sequence 652 AA;
Qy	541	IPLKESSNSIAKFKVTLNSSAIIQLQYRVRIRYASTTNRFLYONSNNDFLYIYINKTMNK	600	Query Match 99.5%; Score 3390; DB 2; Length 652;
Db	541	IPLKESSNSIAKFKVTLNSSAIIQLQYRVRIRYASTTNRFLYONSNNDFLYIYINKTMNK	600	Best Local Similarity 99.5%; Pred. No. 1.6e-75; 1: Mismatches 2; Indels 0; Gaps 0;
Qy	601	DDDLTQFDTATTNSMNGFSGDKNEELIGAESFSVNEKITYDKIEFIPVQL	652	Matches 649; Conservative 1; Mismatches 1; Indels 2; Gaps 0;
Db	601	DDDLTQFDTATTNSMNGFSGDKNEELIGAESFSVNEKITYDKIEFIPVQL	652	1 MNPNNR SERDTIKTPNSELQTNHQYPLADNPNSTLLEINKEFIRMTEDSSTEVLQDN 60
Qy	61	TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW	652	1 MNPNNR SERDTIKTPNSELQTNHQYPLADNPNSTLLEINKEFIRMTEDSSTEVLQDN 60
Db	61	TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW	652	61 TVKDAVGTSVVGQILGVGVPPAGALTSPYOSFLNTIMPSDADFWKAFMAQVEYLIDK 120
Qy	121	KIEEYAKSKALAELOGLQNNFEDYNAISWMKKTPSLRSKRSODIRELPSQAEHSFRN	180	61 TVKDAVGTSVVGQILGVGVPPAGALTSPYOSFLNTIMPSDADFWKAFMAQVEYLIDK 120
Db	121	KIEEYAKSKALAELOGLQNNFEDYNAISWMKKTPSLRSKRSODIRELPSQAEHSFRN	180	121 KIEEYAKSKALAELOGLQNNFEDYNAISWMKKTPSLRSKRSODIRELPSQAEHSFRN 180
Qy	181	SMPSFAVSKPEVLFPLTYAQANTHLLKDAQVFGEGEWGYSSEDVAEPYHQLKEIQQY	240	Qy 181 SMPSFAVSKPEVLFPLTYAQANTHLLKDAQVFGEGEWGYSSEDVAEPYHQLKEIQQY 240
Db	181	SMPSFAVSKPEVLFPLTYAQANTHLLKDAQVFGEGEWGYSSEDVAEPYHQLKEIQQY	240	Db 181 SMPSFAVSKPEVLFPLTYAQANTHLLKDAQVFGEGEWGYSSEDVAEPYHQLKEIQQY 240
Qy	241	TDHCVNWNVNGLNGLRGSTYDAWKFNRFREMTLTVDLIVLFPYDILYSKGVTTEL	300	Qy 241 TDHCVNWNVNGLNGLRGSTYDAWKFNRFREMTLTVDLIVLFPYDILYSKGVTTEL 300
Db	241	TDHCVNWNVNGLNGLRGSTYDAWKFNRFREMTLTVDLIVLFPYDILYSKGVTTEL	300	Db 241 TDHCVNWNVNGLNGLRGSTYDAWKFNRFREMTLTVDLIVLFPYDILYSKGVTTEL 300
Qy	301	TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW	360	Qy 301 TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW 360
Db	301	TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW	360	Db 301 TRDIFTDPISLNTLQGYGPTPLSIENSIRKPHLFDLQGIBPHTRLQPGYGDGSFNYW 360
Qy	361	SGNYVETRPSIGSSKTTISPFYGDKSTEPVKLISPFGKVKYRTIANTDVAAPNGKTYLG	420	Qy 361 SGNYVETRPSIGSSKTTISPFYGDKSTEPVKLISPFGKVKYRTIANTDVAAPNGKTYLG 420
Db	361	SGNYVETRPSIGSSKTTISPFYGDKSTEPVKLISPFGKVKYRTIANTDVAAPNGKTYLG	420	Db 361 SGNYVETRPSIGSSKTTISPFYGDKSTEPVKLISPFGKVKYRTIANTDVAAPNGKTYLG 420
Qy	421	VTKVDISQYDQKNETSTQYDSDRGNHYSQDSSDQLPPTTDEPLEKAYSHQNYAE	480	Qy 421 VTKVDISQYDQKNETSTQYDSDRGNHYSQDSSDQLPPTTDEPLEKAYSHQNYAE 480
Db	421	VTKVDISQYDQKNETSTQYDSDRGNHYSQDSSDQLPPTTDEPLEKAYSHQNYAE	480	Db 421 VTKVDISQYDQKNETSTQYDSDRGNHYSQDSSDQLPPTTDEPLEKAYSHQNYAE 480
Qy	481	CFLMDQERGTIPFTWTHRSVDFENTIDAKITOLPVKAYALSSASITIEPGFTCGNL	540	Qy 481 CFLMDQERGTIPFTWTHRSVDFENTIDAKITOLPVKAYALSSASITIEPGFTCGNL 540
Db	481	CFLMDQERGTIPFTWTHRSVDFENTIDAKITOLPVKAYALSSASITIEPGFTCGNL	540	Db 481 CFLMDQERGTIPFTWTHRSVDFENTIDAKITOLPVKAYALSSASITIEPGFTCGNL 540
Qy	541	LFLKESNSIAKFKVTLNSSAIIQLQYRVRIRYASTTMLRLEVQNSNNDFLYIYINKTMNK	600	Qy 541 LFLKESNSIAKFKVTLNSSAIIQLQYRVRIRYASTTMLRLEVQNSNNDFLYIYINKTMNK 600
Db	541	LFLKESNSIAKFKVTLNSSAIIQLQYRVRIRYASTTMLRLEVQNSNNDFLYIYINKTMNK	600	Db 541 LFLKESNSIAKFKVTLNSSAIIQLQYRVRIRYASTTMLRLEVQNSNNDFLYIYINKTMNK 600
Qy	601	DDDLTYQTDFIATTNSMNGFSGDKNEELIGAESFSVNEKITYDKIEFIPVQL	652	Qy 601 DDDLTQFDTATTNSMNGFSGDKNEELIGAESFSVNEKITYDKIEFIPVQL 652
Db	601	DDDLTYQTDFIATTNSMNGFSGDKNEELIGAESFSVNEKITYDKIEFIPVQL	652	Db 601 DDDLTQFDTATTNSMNGFSGDKNEELIGAESFSVNEKITYDKIEFIPVQL 652
			RESULT 29	
			AY23179 standard; protein; 652 AA.	
			AY23179;	
			AY23179;	
			24-AUG-1999 (first entry)	
			Amino acid sequence of Cry3Bb.11228 polypeptide.	
			KW mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; Diabrotica virgifera virgifera LeConte; insecticide resistance.	
			Synthetic.	
			Os Bacillus thuringiensis.	
			XX	
			W09931248-A1.	
			XX	
			24-JUN-1999.	
			XX	
			24-JUN-1999.	
			XX	
			17-DEC-1998;	
			XX	
			9BWO-US026852.	
			XX	
			18-DEC-1997;	
			XX	
			97US-00993170.	
			PR 18-DEC-1997;	
			97US-00993722.	
			PR 18-DEC-1997;	
			97US-00996441.	
			XX	
			(ECOG-) ECOGEN INC.	
			(MONS ) MONSANTO CO.	
			PA	
			XX	
			WPI: 1999-395184/33.	
			XX	
			Insecticidal Bacillus thuringiensis proteins.	
			XX	
			Claim 39; Page 311-313; 51pp; English.	
			PS	
			XX	
			XX	
			CC AAY23172-Y22206, and AAY23208-X23209 represent new Bacillus thuringiensis CC Bacillus mutant Proteins. The specification also describes methods of CC altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb CC polypeptide was modified to have improved insecticidal activity or CC	
			DE Amino acid sequence of Cry3Bb.11241. polypeptide.	





Qy	301	TRDIFTDPFISLNTLQEYGPFLSSENSRKPHLFEDYLOGIEFHTRLQGYFGKDSFENYW	360	CC deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AY23207 represents the wild type Cry3Bb protein).
Db	301	TRDIFTDPFISLNTLQEYGPFLSSENSRKPHLFEDYLOGIEFHTRLQGYFGKDSFENYW	360	CC The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera vergifera LeConte respectively).
Qy	361	SGNYVETRSPGSKTTISPFYGPDKSTEPPVQKLSFRKPHLFEDYLOGIEFHTRLQGYFGKDSFENYW	420	CC The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance
Db	361	SGNYVETRSPGSKTTISPFYGPDKSTEPPVQKLSFRKPHLFEDYLOGIEFHTRLQGYFGKDSFENYW	420	CC
Qy	421	VTKVDFSQDDQNETSTQYDSKRNGHVSQAQSDIDQPPETDEPLEKAYSHOLNAYE	480	CC
Db	421	VTKVDFSQDDQNETSTQYDSKRNGHVSQAQSDIDQPPETDEPLEKAYSHOLNAYE	480	CC
Qy	481	CPLMDQRRTGIPPFPTWTHESVDFNTIDEKIKTQLPVVAYALSGASTLEGIGFTGDNL	540	CC
Db	481	CFLMDQRRTGIPPFPTWTHESVDFNTIDEKIKTQLPVVAYALSGASTLEGIGFTGDNL	540	CC
Qy	541	LFLKESNSNIAKFKVTLNSAALLORYVRIRYASTNLRFLVQNSNNDFLVLVINKTMNK	600	CC
Db	541	LFLKESNSNIAKFKVTLNSAALLORYVRIRYASTNLRFLVQNSNNDFLVLVINKTMNK	600	CC
Qy	601	DDDLITYQFDLATTNSNMGSFDKRNELIGAEFVSNEKIVYDKEFIPVQL	652	CC
Db	601	DDDLITYQFDLATTNSNMGSFDKRNELIGAEFVSNEKIVYDKEFIPVQL	652	CC
RESULT 32				
ID	AY23197	standard: protein; 651 AA.		
XX	AY23197;			
AC				
DT	24-AUG-1999	(first entry)		
XX	Amino acid sequence of Cry3Bb.11048 polypeptide.			
DE				
XX	Cry3Bb; mutant; insecticidal activity; insecticidal specificity;			
KW	coleoptera; southern corn root worm;			
KW	Diabrotica; undecimpunctata howardi Barber; transgenic plant;			
KW	Diabrotica virgifera vergifera LeConte; insecticide resistance.			
OS	Bacillus thuringiensis.			
PN	W09931248-A1.			
XX	24-JUN-1999.			
XX	17-DEC-1998;	98WO-US026852.		
PR	18-DEC-1997;	97US-00993170.		
PR	18-DEC-1997;	97US-00993722.		
PR	18-DEC-1997;	97US-00993775.		
PR	18-DEC-1997;	97US-00996441.		
XX	(ECOG -) ECOGEN INC.			
PA	(MONS ) MONSANTO CO.			
XX	Insecticidal Bacillus thuringiensis proteins.			
PT	Claim 39; Page 412-415; 512pp; English.			
PS	AY23172-Y23206, and AAX23208-X23209 represent new Bacillus thuringiensis Cry3Bb mutant proteins. The specification also describes methods of altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or			
XX	601 DDDLYQFDLATTNSNMGSFDKRNELIGAEFVSNEKIVYDKEFIPVQL	652		
Db	600 DDDLYQFDLATTNSNMGSFDKRNELIGAEFVSNEKIVYDKEFIPVQL	651		
RESULT 33				
ID	AY23183	standard; protein; 652 AA.		
XX	AY23183;			
AC				
DT	24-AUG-1999	(first entry)		
XX	Amino acid sequence of Cry3Bb.11232 polypeptide.			
KW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity;			

KW	coleoptera; southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant;	Qy	301 TRDIFTDPFLSLNTLQEYGPFLPLSIENSIRKPHLFDYLOGIEPHTRLQPGYFGKDSFNYW 360
KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.	Db	301 TRDIFTDPFLPLQDQGPFLPLSIENSIRKPHLFDYLOGIEPHTRLQPGYFGKDSFNYW 360
XX		Qy	361 SGNYVETRPSIGSSKTTSPFYGDKSTEEVQLSFDGQVYRTANTDVAWPGKTYLG 420
Synthetic C.		Db	361 SGNYVETRPSIGSSKTTSPFYGDKSTEEVQLSFDGQVYRTANTDVAWPGKTYLG 420
OS		Qy	
OS	Bacillus thuringiensis.	Db	
XX		Qy	
W09931248-A1.		Db	
XX		Qy	421 VTKVDFSOYDDQNETSTQYDSKRNGNCHVSAQDSIDQLPETTDEPLEKAYSHOLNAYE 480
PD	24-JUN-1999.	Db	421 VTKVDFSOYDDQNETSTQYDSKRNGNCHVSAQDSIDQLPETTDEPLEKAYSHOLNAYE 480
XX		Qy	
PP	17-DEC-1998;	Db	
XX	98WO-US026852.	Qy	
PR	18-DEC-1997;	Db	481 CPMQDRGTRGTTIPFTWTHRSVDFPNTIDEKIKTOLPVKAYAASSGASLIEGPGCFTGGNL 540
PR	97US-00993170.	Db	481 CPMQDRGTRGTTIPFTWTHRSVDFPNTIDEKIKTOLPVKAYAASSGASLIEGPGCFTGGNL 540
PR	97US-00993172.	Qy	
PR	18-DEC-1997;	Db	541 LFLKESSSNSIAKFKVTLNSALLORYVRIRYASTTNRLFVQNSNDLVLVYINKTMK 600
PR	97US-00993775.	Db	541 LFLKESSSNSIAKFKVTLNSALLORYVRIRYASTTNRLFVQNSNDLVLVYINKTMK 600
PR	18-DEC-1997;	Qy	
PR	97US-00996441.	Db	
XX		Qy	
PA (ECOG- ) ECOGEN INC.		Db	
PA (MONS ) MONSANTO CO.		Qy	601 DDDITYQTFLATNSNMGFSGDKNELIIGAESFVSNEKYIDKIEFIPVQL 652
PA		Db	601 DDDITYQTFLATNSNMGFSGDKNELIIGAESFVSNEKYIDKIEFIPVQL 652
XX		RESULT 34	
PT		ID	AAV3174 standard; protein; 652 AA.
XX		XX	
PS	Claim 39: Page 334-336; 512pp; English.	AC	AAV3174;
XX		XX	
CC	AAY23172-Y23206, and AAX22208-X23209 represent new <i>Bacillus thuringiensis</i> altering <i>Bacillus thuringiensis</i> Cry3Bb polypeptide. The specific method of Cry3Bb polypeptide was modified to have improved insecticidal activity; insecticidal specificity; enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution. The deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AAV3207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, ( <i>Diabrotica undecimpunctata howardi</i> Barber, and <i>Diabrotica virgifera virgifera</i> LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.	DT	24-AUG-1999 (First entry)
CC		DE	Amino acid sequence of Cry3Bb.11223 polypeptide.
CC		XX	
CC		XX	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; <i>Diabrotica virgifera virgifera</i> LeConte; insecticide resistance.
CC		XX	
CC		XX	Synthetic.
CC		OS	<i>Bacillus thuringiensis</i> .
CC		XX	
CC		PN	W09931248-A1.
CC		XX	
CC		PD	24-JUN-1999.
CC		XX	
CC		PF	17-DEC-1998;
CC		XX	98WO-US026852.
SQ	Sequence 652 AA;	PS	
Qy	Query Match 99.4%; Score 3387; DB 2; Length 652;	PR	18-DEC-1997;
Best Local Similarity 99.4%; Pred. No. 2..9e-275;	Mismatches 2; Indels 0; Gaps 0;	PR	18-DEC-1997;
Matches 648; Conservative		PR	18-DEC-1997;
Qy	1 MNPNRNSEDDTIKVTPNSLQELTHNQYPLADNPNSTLLEEFLNKFIRLMEDSSTEVLDS 60	PR	18-DEC-1997;
Db	1 MNPNRNSEDDTIKVTPNSLQELTHNQYPLADNPNSTLLEEFLNKFIRLMEDSSTEVLDS 60	XX	97US-00993775.
Db	61 TVKDAVGCGISVQGQILGVPGPAGALTSPFQSLNTWPSDAPKAFMAQVEVLIDK 120	XX	97US-00993775.
Db	61 TVKDAVGCGISVQGQILGVPGPAGALTSPFQSLNTWPSDAPKAFMAQVEVLIDK 120	XX	97US-00993775.
Qy	121 KIEBYAKSKALABQGLQLNNFEDYVNALSMWKTPLSLRSKRSQDRTRLEFSQAEHSFRN 180	XX	97US-00993775.
Db	121 KIEBYAKSKALABQGLQLNNFEDYVNALSMWKTPLSLRSKRSQDRTRLEFSQAEHSFRN 180	XX	97US-00993775.
Qy	181 SMPEFAVSKFEVFLPFLPTVQAQANTHLLIKDADVFGWGISSVEDAFAFPHQKLTKQY 240	XX	97US-00993775.
Db	181 SMPEFAVSKFEVFLPFLPTVQAQANTHLLIKDADVFGWGISSVEDAFAFPHQKLTKQY 240	XX	97US-00993775.
Qy	241 TDICCVNWYNTVGLAICLRGSTYDAWKFKFNRFRENTLTVLDLIVLFFPFDIIRLYSKGVKTEL 300	XX	97US-00993775.
Db	241 TDICCVNWYNTVGLAICLRGSTYDAWKFKFNRFRENTLTVLDLIVLFFPFDIIRLYSKGVKTEL 300	XX	97US-00993775.

CC polypeptide, wherein the substitution or deletion occurs at a position  
 CC corresponding to from about amino acids 1-365 of the unmodified  
 CC polypeptide sequence (AAV23207 represents the wild type Cry3Bb protein).  
 CC The polypeptide can be used to kill coleopteran pests, especially by  
 CC application to the environment. It is especially useful against southern  
 CC corn rootworm and western corn root worm. (Diabrotica undecimpunctata  
 CC howardi Barber, and Diabrotica virgifera virgifera LeConte respectively).  
 CC The mutant cry3Bb polynucleotides can also be used to produce transgenic  
 CC plants with increased insecticide resistance.

XX Sequence 652 AA;

Query Match 99.4%; Score 3386; DB 2; Length 652;  
 Best Local Similarity 99.5%; Pred. No. 3.56-275;  
 Matches 649; Conservative 3; Indels 0; Gaps 0;  
 XX  
 Qy 1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTLELNYKEFLMTEDSSTEVLDNS 60  
 Db 1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTLELNYKEFLMTEDSSTEVLDNS 60  
 Qy 61 TVKDAVGTCISVYQILGVGVPFAGALTFSYQISFLNTIWPSPDAFWMAQEVVLIDK 120  
 Db 61 TVKDAVGTCISVQILGVGVPFAGALTFSYQISFLNTIWPSPDAFWMAQEVVLIDK 120  
 Qy 121 KIEEYAKSKALAELQGLQNINFEDYVNAISWKTPSLRSKRSQDRTRFLSOAESFRN 180  
 Db 121 KIEEYAKSKALAELQGLQNINFEDYVNAISWKTPSLRSKRSQDRTRFLSOAESFRN 180  
 Qy 181 SMPSFAVSKPFEVLPPTIAQAANTHLLIKDAQVPGEEWGYSSEDVAEYHQLKQY 240  
 Db 181 SMPSFAVSKPFEVLPPTIAQAANTHLLIKDAQVGEWGYSSEDVAEYHQLKQY 240  
 Qy 241 TDHCVNWNVNGLNLGRGSTDYDAWVKFNRFRRENTLTVLDLIVLFFDYLRYLSKGVKTEL 300  
 Db 241 TDHCVNWNVNGLNLGRGSTDYDAWVKFNRFRRENTLTVLDLIVLFFDYLRYLSKGVKTEL 300  
 Qy 301 TRDIFTDPFSLNLTLQETGPTFELSIENSTRKPHLFDFYLQGIEBPHTRIQPQGYFKDSFNYW 360  
 Db 301 TRDIFTDPFSLNLTLQETGPTFELSIENSTRKPHLFDFYLQGIEBPHTRIQPQGYFKDSFNYW 360  
 Qy 361 SGNYVETRSIGSSKTTSPYGDKSTEVQKLSFGDKVYRTIANTDVAAPNGKTYLG 420  
 Db 361 SGNYVETRSIGSSKTTSPYGDKSTEVQKLSFGDKVYRTIANTDVAAPNGKTYLG 420  
 Qy 421 VTKYDFSQDDQKNETSTQTYDSKRNNGHVSAQSDIDLPPTTDEPLEKAYSHOLNYA 480  
 Db 421 VTKYDFSQDDQKNETSTQTYDSKRNNGHVSAQSDIDLPPTTDEPLEKAYSHOLNYA 480  
 Qy 481 CFLMQDRRSTIPFPTWHSVDFNTTDAEKITQLPVYKAYAASSGASIEGPGFTGQNL 540  
 Db 481 CFLMQDRRSTIPFPTWHSVDFNTTDAEKITQLPVYKAYAASSGASIEGPGFTGQNL 540  
 Qy 541 LFLKESSNSIAKPTVTLNSAALLQYRTRVYASTTNRFLYQNSNNDFLYYINKTMNK 600  
 Db 541 LFLKESSNSIAKPTVTLNSAALLQYRTRVYASTTNRFLYQNSNNDFLYYINKTMNK 600  
 Qy 601 DDDLTYQTPDATTNSNNGCSDGNELITGAESFSVSNKXIVYDKEFIPVQL 652  
 Db 601 DDDLTYQTPDATTNSNNGCSDGNELITGAESFSVSNKXIVYDKEFIPVQL 652

RESULT 35  
 AAV23185 standard; protein: 652 AA.  
 XX AAV23185;  
 XX 24-AUG-1999 (first entry)

DE Amino acid sequence of Cry3Bb.11234 polypeptide.  
 KW mutant; insecticidal activity; insecticidal specificity;  
 KW coleoptera; southern corn rootworm; western corn root worm;

KW Diabrotica undecimpunctata howardi Barber; transgenic plant;  
 KW Diabrotica virgifera virgifera LeConte; insecticide resistance.  
 XX Synthetic.  
 OS Bacillus thuringiensis.  
 XX WO9931248-A1.  
 PN 24-JUN-1999.  
 XX PD 24-JUN-1999.  
 XX XX 98WO-US026852.  
 PR 17-DEC-1998; 98WO-US026852.  
 PR 18-DEC-1997; 97US-00993170.  
 PR 18-DEC-1997; 97US-00993172.  
 PR 18-DEC-1997; 97US-00993775.  
 PR 18-DEC-1997; 97US-00996441.  
 PA (ECOGEN INC.  
 PA (MONSANTO CO.  
 PI English L, Brusbock SM, Malvar TM, Bryson JW, Kuleba CA;  
 PI Walters RS, Slatkin SL, Von Tersch MA, Romano C;  
 XX DR WPI; 1999-395184/33.  
 XX PR Insecticidal Bacillus thuringiensis proteins.  
 XX XX Claim 39; Page 345-347; 512pp; English.  
 XX XX AAY23172-Y23206, and AAY23208-X23209 represent new *Bacillus thuringiensis*  
 CC Cry3Bb mutant proteins. The specification also describes methods of  
 CC altering *Bacillus thuringiensis* Cry3Bb. The B. thuringiensis Cry3Bb  
 CC polypeptide was modified to have improved insecticidal activity or  
 CC enhanced insecticidal specificity against a target insect. The  
 CC modification comprises at least one amino acid substitution, addition, or  
 CC deletion in the primary sequence of the native or unmodified Cry3Bb  
 CC polypeptide, wherein the substitution or deletion occurs at a position  
 CC corresponding to from about amino acids 1-365 of the unmodified  
 CC polypeptide sequence (AAV23207 represents the wild type Cry3Bb protein).  
 CC The polypeptide can be used to kill coleopteran pests, especially by  
 CC application to the environment. It is especially useful against southern  
 CC corn rootworm and western corn root worm, (Diabrotica undecimpunctata  
 CC howardi Barber, and Diabrotica virgifera virgifera LeConte respectively).  
 CC The mutant cry3Bb polynucleotides can also be used to produce transgenic  
 CC plants with increased insecticide resistance.

XX Sequence 652 AA;

Query Match 99.4%; Score 3386; DB 2; Length 652;  
 Best Local Similarity 99.4%; Pred. No. 3.56-275;  
 Matches 648; Conservative 1; Mismatches 3; Indels 0; Gaps 0;  
 Qy 1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTLELNYKEFLMTEDSSTEVLDNS 60  
 Db 1 MNPNRSEDTIKTPNSLQTNQYPLADNPNSTLELNYKEFLMTEDSSTEVLDNS 60  
 Qy 61 TVKDAVGTCISVQILGVGVPFAGALTFSYQISFLNTIWPSPDAFWMAQEVVLIDK 120  
 Db 61 TVKDAVGTCISVQILGVGVPFAGALTFSYQISFLNTIWPSPDAFWMAQEVVLIDK 120  
 Qy 121 KIEEYAKSKALAELQGLQNINFEDYVNAISWKTPSLRSKRSQDRTRFLSOAESFRN 180  
 Db 121 KIEEYAKSKALAELQGLQNINFEDYVNAISWKTPSLRSKRSQDRTRFLSOAESFRN 180  
 Qy 181 SMPSFAVSKPFEVLPPTIAQAANTHLLIKDAQVPGEEWGYSSEDVAEYHQLKQY 240  
 Db 181 SMPSFAVSKPFEVLPPTIAQAANTHLLIKDAQVGEWGYSSEDVAEYHQLKQY 240  
 Qy 241 TDHCVNWNVNGLNLGRGSTDYDAWVKFNRFRRENTLTVLDLIVLFFDYLRYLSKGVKTEL 300  
 Db 241 TDHCVNWNVNGLNLGRGSTDYDAWVKFNRFRRENTLTVLDLIVLFFDYLRYLSKGVKTEL 300  
 Qy 301 TRDIFTDPFSLNLTLQETGPTFELSIENSTRKPHLFDFYLQGIEBPHTRIQPQGYFKDSFNYW 360  
 Db 301 TRDIFTDPFSLNLTLQETGPTFELSIENSTRKPHLFDFYLQGIEBPHTRIQPQGYFKDSFNYW 360  
 Qy 361 SGNYVETRSIGSSKTTSPYGDKSTEVQKLSFGDKVYRTIANTDVAAPNGKTYLG 420  
 Db 361 SGNYVETRSIGSSKTTSPYGDKSTEVQKLSFGDKVYRTIANTDVAAPNGKTYLG 420  
 Qy 421 VTKYDFSQDDQKNETSTQTYDSKRNNGHVSAQSDIDLPPTTDEPLEKAYSHOLNYA 480  
 Db 421 VTKYDFSQDDQKNETSTQTYDSKRNNGHVSAQSDIDLPPTTDEPLEKAYSHOLNYA 480  
 Qy 481 CFLMQDRRSTIPFPTWHSVDFNTTDAEKITQLPVYKAYAASSGASIEGPGFTGQNL 540  
 Db 481 CFLMQDRRSTIPFPTWHSVDFNTTDAEKITQLPVYKAYAASSGASIEGPGFTGQNL 540  
 Qy 541 LFLKESSNSIAKPTVTLNSAALLQYRTRVYASTTNRFLYQNSNNDFLYYINKTMNK 600  
 Db 541 LFLKESSNSIAKPTVTLNSAALLQYRTRVYASTTNRFLYQNSNNDFLYYINKTMNK 600  
 Qy 601 DDDLTYQTPDATTNSNNGCSDGNELITGAESFSVSNKXIVYDKEFIPVQL 652  
 Db 601 DDDLTYQTPDATTNSNNGCSDGNELITGAESFSVSNKXIVYDKEFIPVQL 652

Qy 121 KIEEYAKSKALAELQGLQNINFEDYVNAISWKTPSLRSKRSQDRTRFLSOAESFRN 180  
 Db 121 KIEEYAKSKALAELQGLQNINFEDYVNAISWKTPSLRSKRSQDRTRFLSOAESFRN 180  
 Qy 181 SMPSFAVSKPFEVLPPTIAQAANTHLLIKDAQVPGEEWGYSSEDVAEYHQLKQY 240  
 Db 181 SMPSFAVSKPFEVLPPTIAQAANTHLLIKDAQVGEWGYSSEDVAEYHQLKQY 240  
 Qy 241 TDHCVNWNVNGLNLGRGSTDYDAWVKFNRFRRENTLTVLDLIVLFFDYLRYLSKGVKTEL 300  
 Db 241 TDHCVNWNVNGLNLGRGSTDYDAWVKFNRFRRENTLTVLDLIVLFFDYLRYLSKGVKTEL 300  
 Qy 301 TRDIFTDPFSLNLTLQETGPTFELSIENSTRKPHLFDFYLQGIEBPHTRIQPQGYFKDSFNYW 360

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XX	KW	Diabrotica virgifera virgifera LeConte; insecticide resistance
XX	OS	Synthetic.
XX	OS	Bacillus thuringiensis.
XX	PN	WC9931248-A1.
XX	PD	24-JUN-1999.
XX	PF	98WO-US026852.
XX	PR	17-DEC-1997; 97US-00993170.
XX	PR	18-DEC-1997; 97US-00993172.
XX	PR	18-DEC-1997; 97US-00993175.
XX	PR	18-DEC-1997; 97US-00996441.
XX	PA	(ECOG-) ECOGEN INC.
XX	PA	(MONS ) MONSANTO CO.
XX	PI	English L, Brussock SM, Malvar TM, Bryson JW, Kulesza CA;
XX	PI	Walters FS, Slatkin SL, Von Tersch MA, Romano C;
XX	DR	WPI: 1999-395184/33.
XX	PT	Insecticidal Bacillus thuringiensis proteins.
XX	PS	Claim 39; Page 328-330; 512pp; English.
XX	CC	AAV23172-Y23206, and AX23208-X23209 represent new Bacillus thuringiensis Cry3Bb mutant proteins. The specification also describes methods for altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity and enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified Cry3Bb polypeptide sequence (AAV23207 represents the wild type Cry3Bb). The polypeptide can be used to kill coleopteran pests, especially application to the environment. It is especially useful against corn rootworm and western corn root worm, Diabrotica undecimpunctata Howard Barber, and Diabrotica virgifera virgifera LeConte respectively. The mutant cry3Bb polypeptides can also be used to produce transgenic plants with increased insecticide resistance
XX	SQ	Sequence 652 AA:
Query	Match	99.3%; Score 3382; DB 2; Length 652;
Best	Local Similarity	99.4%; Pred. No. 7.7e-275;
Matches	648; Conservative	1; Mismatches 3; Indels 0;
Qy	1	MNPNNRSEHDITKVTNPSELQTHQYPLADNPNSTLLENYKSEFLRMTEDSS
Db	1	MNPNNRSEHDITKVTNPSELQTHQYPLADNPNSTLLENYKSEFLRMTEDSS
Qy	61	TVKDAVGTGISVQGQIIGVYGVFAGALTSPYQSPQNTIWPSPDADPKAFMAQV
Db	61	TVKDAVGTGISVQGQIIGVYGVFAGALTSPYQSPQNTIWPSPDADPKAFMAQV
Qy	121	KIEEYAKSKALAELOGIQLQNNFEDYNAIWSMKKPLLSRSQRDRFLSFQ
Db	121	KIEEYAKSKALAELOGIQLQNNFEDYNAIWSMKKPLLSRSQRDRFLSFQ
Qy	181	SMPSPFAVSKFPEVLFLPTYAQANTHLLKDAQVGEENGYSSEDVABYHROL
Db	181	SMPSPFAVSKFPEVLFLPTYAQANTHLLKDAQVGEENGYSSEDVABYHROL
Qy	241	TDHCVNWNVNGLNLGLGSTDYAWKPNRFRMELTVLDLIVLPFYDIRLYSK
Db	241	TDHCVNWNVNGLNLGLGSTDYAWKPNRFRMELTVLDLIVLPFYDIRLYSK
Qy	301	TRD1FDPF5NTLQSYGPFLSTENSTKPHFLDYLQIEFTRQLQGYFGK

Db	301	TRDIFTDPFLITLQKRYGPPFLSITNSIRKPHLFLQGFLQFHLQFLQGFLQFGRKSFNYW	360
Qy	361	SGNYVETRPSIGSSKTITSPYQDK1STEYQKLSPDGQKVRITIANTDVAAPNGKVKYLG	420
Db	361	SGNYVETRPSIGSSKTITSPYQDK1STEYQKLSPDGQKVRITIANTDVAAPNGKVKYLG	420
Db	421	VTKVDFQYDQKVNKTSTQYDVKRNHGYSQDSIDQLPPTTDEPLEKAYSHQNYAE	480
Qy	421	VTKVDFQYDQKVNKTSTQYDVKRNHGYSQDSIDQLPPTTDEPLEKAYSHQNYAE	480
Db	481	CFLMDQDRGTTIPFETWTHRSYDFNTIDAETK1TOLPVKAYALSGAS11EGPGBTGGNL	540
Qy	481	CFLMDQDRGTTIPFETWTHRSYDFNTIDAETK1TOLPVKAYALSGAS11EGPGBTGGNL	540
Db	541	LPLKEKSSNSIAKPKTILNSAAL1Q9YRVRYASTNLRLFVQNSNNDFLVY1NKTMK	600
Qy	541	LPLKEKSSNSIAKPKTILNSAAL1Q9YRVRYASTNLRLFVQNSNNDFLVY1NKTMK	600
Db	601	DDDLT1QTFDIAATTNSNMGFGDDKRNBLIGAESFSVNEK1YIDK1EPIPVQL	652
Qy	601	DDDLT1QTFDIAATTNSNMGFGDDKRNBLIGAESFSVNEK1YIDK1EPIPVQL	652
Db	601	DDDLT1QTFDIAATTNSNMGFGDDKRNBLIGAESFSVNEK1YIDK1EPIPVQL	652
RESULT 38			
	AAV23190		
	ID	AAV23190 standard; protein; 652 AA.	
	XX		
	AC	AAV23190;	
	XX		
	DT	24-AUG-1999 (first entry)	
	XX		
	DE	Amino acid sequence of Cry3Bb-11239 polypeptide.	
	XX		
	KW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity;	
	KW	coleoptera; southern corn rootworm; western corn root worm;	
	KW	Diabrotica undecimpunctata howardi Barber; transgenic plant;	
	KW	Diabrotica virgifera virgifera LeConte; insecticide resistance.	
	XX		
	OS	Synthetic.	
	OS	Bacillus thuringiensis.	
	XX		
	PN	WO931248-A1.	
	XX		
	PD	24-JUN-1999.	
	XX		
	PF	98WO-US026852.	
	XX		
	17-DEC-1998;		
	XX		
	PR	97US-0094170.	
	PR	18-DEC-1997;	
	PR	97US-0093722.	
	PR	18-DEC-1997;	
	PR	97US-0093775.	
	PR	18-DEC-1997;	
	XX		
	PA	97US-0096441.	
	PA	(ECOG-) ECOGEN INC.	
	PA	(MONS ) MONSANTO CO.	
	XX		
	English L,	Malvar TM,	
	Walters FS,	Bryson JW,	
	Statin SL,	Kulesza CA;	
	XX		
	DR	Von Tersch MA,	
	WPI,	Romano C;	
	XX		
	PT	Insecticidal Bacillus thuringiensis proteins.	
	XX		
	PS	Claim 39; Page 373-375; 512pp; English.	
	XX		
	CC	AAV23172-Y23206, and AAV23208-X23209 represent new Bacillus thuringiensis	
	CC	Cry3Bb mutant proteins. The specificity also represents methods of	
	CC	altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb	
	CC	polypeptide was modified to have improved insecticidal activity or	
	CC	enhanced insecticidal specificity against a target insect. The	
	CC	modification comprises at least one amino acid substitution, addition, or	
	CC	deletion in the primary sequence of the native or unmodified Cry3Bb	
	CC	polypeptide, wherein the substitution or deletion occurs at a position	
	CC	corresponding to from about amino acids 1-1665 of the unmodified	

polypeptide sequence (AY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.

Sequence 652 AA;

Query Match 99.2%; Score 3380; DB 2; Length 652;

Best Local Similarity 99.4%; Pred. No. 1.1e-247; Matches 648; Conservative 0; Mismatches 4; Indels 0; Gaps 0;

Db 1 MNPNRNRSEHDITIKTPNSELQTHNQYPLADNNTSLLEELNKPEFLRMTEDSSTEVLIDNS 60  
 Qy 1 KIEEYAKSRAKALABQGLQNLNFEDYNAI NSWKTPLSLRSRSQDRISLTFQPELQVFLIDK 120  
 Db 61 TVKDAVGPGISVNGQI LGVGVPFGA LSTFVQFSFLNTWPSDADPMKAFQAQVEFLIDK 120  
 Qy 61 TVKDAVGPGISVNGQI LGVGVPFGA LSTFVQFSFLNTWPSDADPMKAFQAQVEFLIDK 120  
 Db 61 TVKDAVGPGISVNGQI LGVGVPFGA LSTFVQFSFLNTWPSDADPMKAFQAQVEFLIDK 120  
 Qy 121 KIEEYAKSRAKALABQGLQNLNFEDYNAI NSWKTPLSLRSRSQDRISLTFQPELQVFLIDK 180  
 Db 121 KIEEYAKSRAKALABQGLQNLNFEDYNAI NSWKTPLSLRSRSQDRISLTFQPELQVFLIDK 180  
 Qy 181 SMPSFAYSKFEVFLFLPTYAQANTHLLKDQVFGREWGSSEDYAFYHFLQKLTQY 240  
 Db 181 SMPSFAYSKFEVFLFLPTYAQANTHLLKDQVFGREWGSSEDYAFYHFLQKLTQY 240  
 Qy 241 TDHCVNNTVNGVNGLRLGSTYDAWKENFRFREMTLTVDLIVLFPFYDRLYSKGYKTEL 300  
 Db 241 TDECVNNTVNGVNGLRLGSTYDAWKENFRFREMTLTVDLIVLFPFYDRLYSKGYKTEL 300  
 Qy 301 TRDIFTDPIFSNTLQEGPTFISIENSIRKPHFLDYLOGIEFPHTRIQLQYFGKDSFNYW 360  
 Db 301 TRDIFTDPIFSNTLQEGPTFISIENSIRKPHFLDYLOGIEFPHTRIQLQYFGKDSFNYW 360  
 Qy 361 SGNYVETRPSIGSSKTITSFYGDKSTEPVQKLSDFGQKVTRIANTDVAWNGKRVYLG 420  
 Db 361 SGNYVETRPSIGSSKTITSFYGDKSTEPVQKLSDFGQKVTRIANTDVAWNGKRVYLG 420  
 Qy 421 VTKVDFESQYDORNNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPLEKAYSHQLYNAE 480  
 Db 421 VTKVDFESQYDORNNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPLEKAYSHQLYNAE 480  
 Qy 481 CPMQDRGRTIPFPTWTHSYDFENTIDAEKITOLPVPVKA YALSSASIEFGPGFTGGNL 540  
 Db 481 CPMQDRGRTIPFPTWTHSYDFENTIDAEKITOLPVPVKA YALSSASIEFGPGFTGGNL 540  
 Qy 541 LFLKESSNSIAKFKVTLNSAALLQRTYVRASTINLRLPVQNSNNDFLYIYINKTMNK 600  
 Db 541 LFLKESSNSIAKFKVTLNSAALLQRTYVRASTINLRLPVQNSNNDFLYIYINKTMNK 600  
 Qy 601 DDDLTQTFDIAATTNSNGFSGDNELIIGAESFVNEKEIYDKEFIPYVOL 652  
 Db 601 DDDLTQTFDIAATTNSNGFSGDNELIIGAESFVNEKEIYDKEFIPYVOL 652  
 Qy 652 RESULT 39  
 AY23189  
 ID AY23189 standard; protein; 652 AA.  
 XX AC AY23189;  
 XX DT 24-AUG-1999 (first entry)  
 XX DB Amino acid sequence of Cry3Bb.11238 polypeptide.  
 XX KW Cry3Bb; mutant; insecticidal activity; insecticidal specificity;  
 XX coleoptera; southern corn rootworm; western corn root worm;  
 XX Diabrotica undecimpunctata howardi Barber; transgenic plant;  
 XX Diabrotica virgifera virgifera LeConte; insecticide resistance.

XX OS Synthetic.  
 XX OS Bacillus thuringiensis.  
 XX OS  
 XX PN WO9931248-A1.  
 XX PD 24-JUN-1999.  
 XX XX 17-DEC-1998; 98WO-US024852.  
 XX PF XX  
 PR 18-DEC-1997; 97US-00993170.  
 PR 18-DEC-1997; 97US-00993722.  
 PR 18-DEC-1997; 97US-00993775.  
 PR 18-DEC-1997; 97US-00993441.  
 XX PA (ECOG-) ECOGEN INC.  
 PA (MONS ) MONSANTO CO.  
 XX PI English L, Brussock SM, Malvar TM, Bryson JW, Kulesza CA;  
 PA Walters PS, Slatin SL, Von Tersch MA, Romano C;  
 XX PI  
 XX DR WPI; 1999-395184/33.  
 XX PT Insecticidal Bacillus thuringiensis proteins.  
 XX XX  
 XX Claim 39; Page 367-370; 512pp; English.  
 XX XX  
 XX AAY2172-Y23206, and AAY23208-X23209 represent new *Bacillus thuringiensis* Cry3Bb mutant Proteins. The specific application describes methods of altering *Bacillus thuringiensis* Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-365 of the unmodified polypeptide sequence (AY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). The mutant cry3Bb polynucleotides can also be used to produce transgenic plants with increased insecticide resistance.  
 XX Sequence 652 AA:  
 XX  
 XX Query Match 99.2%; Score 3380; DB 2; Length 652;  
 XX Best Local Similarity 99.4%; Pred. No. 1.1e-274;  
 XX Matches 648; Conservative 0; Mismatches 4; Indels 0; Gaps 0;  
 XX  
 Qy 1 MNPNRNRSEHDITIKTPNSELQTHNQYPLADNNTSLLEELNKPEFLRMTEDSSTEVLIDNS 60  
 Db 1 MNPNRNRSEHDITIKTPNSELQTHNQYPLADNNTSLLEELNKPEFLRMTEDSSTEVLIDNS 60  
 Qy 61 TVKDAVGPGISVNGQI LGVGVPFGA LSTFVQFSFLNTWPSDADPMKAFQAQVEFLIDK 120  
 Db 61 TVKDAVGPGISVNGQI LGVGVPFGA LSTFVQFSFLNTWPSDADPMKAFQAQVEFLIDK 120  
 Qy 121 KIEEYAKSRAKALABQGLQNLNFEDYNAI NSWKTPLSLRSRSQDRISLTFQPELQVFLIDK 180  
 Db 121 KIEEYAKSRAKALABQGLQNLNFEDYNAI NSWKTPLSLRSRSQDRISLTFQPELQVFLIDK 180  
 Qy 181 SMPSFAYSKFEVFLFLPTYAQANTHLLKDQVFGREWGSSEDYAFYHFLQKLTQY 240  
 Db 181 SMPSFAYSKFEVFLFLPTYAQANTHLLKDQVFGREWGSSEDYAFYHFLQKLTQY 240  
 Qy 241 TDHCVNNTVNGVNGLRLGSTYDAWKENFRFREMTLTVDLIVLFPFYDRLYSKGYKTEL 300  
 Db 241 TDECVNNTVNGVNGLRLGSTYDAWKENFRFREMTLTVDLIVLFPFYDRLYSKGYKTEL 300  
 Qy 301 TRDIFTDPIFSNTLQEGPTFISIENSIRKPHFLDYLOGIEFPHTRIQLQYFGKDSFNYW 360  
 Db 301 TRDIFTDPIFSNTLQEGPTFISIENSIRKPHFLDYLOGIEFPHTRIQLQYFGKDSFNYW 360  
 Qy 361 SGNYVETRPSIGSSKTITSFYGDKSTEPVQKLSDFGQKVTRIANTDVAWNGKRVYLG 420  
 Db 361 SGNYVETRPSIGSSKTITSFYGDKSTEPVQKLSDFGQKVTRIANTDVAWNGKRVYLG 420  
 Qy 421 VTKVDFESQYDORNNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPLEKAYSHQLYNAE 480  
 Db 421 VTKVDFESQYDORNNETSTQYDTSKRNGHVSQDSIDQLPPTTDEPLEKAYSHQLYNAE 480  
 Qy 481 CPMQDRGRTIPFPTWTHSYDFENTIDAEKITOLPVPVKA YALSSASIEFGPGFTGGNL 540  
 Db 481 CPMQDRGRTIPFPTWTHSYDFENTIDAEKITOLPVPVKA YALSSASIEFGPGFTGGNL 540  
 Qy 541 LFLKESSNSIAKFKVTLNSAALLQRTYVRASTINLRLPVQNSNNDFLYIYINKTMNK 600  
 Db 541 LFLKESSNSIAKFKVTLNSAALLQRTYVRASTINLRLPVQNSNNDFLYIYINKTMNK 600  
 Qy 601 DDDLTQTFDIAATTNSNGFSGDNELIIGAESFVNEKEIYDKEFIPYVOL 652  
 Db 601 DDDLTQTFDIAATTNSNGFSGDNELIIGAESFVNEKEIYDKEFIPYVOL 652  
 Qy 652 RESULT 39  
 AY23189  
 ID AY23189 standard; protein; 652 AA.  
 XX AC AY23189;  
 XX DT 24-AUG-1999 (first entry)  
 XX DB Amino acid sequence of Cry3Bb.11238 polypeptide.  
 XX KW Cry3Bb; mutant; insecticidal activity; insecticidal specificity;  
 XX coleoptera; southern corn rootworm; western corn root worm;  
 XX Diabrotica undecimpunctata howardi Barber; transgenic plant;  
 XX Diabrotica virgifera virgifera LeConte; insecticide resistance.

Qy	361	SGNYVETRPSIGSSKTTISPFYGDOKYRTIANTID/BAWPNGKVKYLG	420	CC The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm. (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera vergifera LeConte respectively).
Db	361	SGNYVETRPSIGSSKTTISPFYGDOKYRTIANTID/BAWPNGKVKYLG	420	CC The mutant cry3Bb polypeptides can also be used to produce transgenic plants with increased insecticide resistance
Qy	421	VTKYDFSQYDODKNETSTQYD/SCRNNGHVAQDQSIDQLPETDDEPLEKAYSHOLNYAE	480	CC
Db	421	VTKYDFSQYDODKNETSTQYD/SCRNNGHVAQDQSIDQLPETDDEPLEKAYSHOLNYAE	480	CC
Qy	481	CFLMQDRGTTIPFTWTHRSVDFPFTKVTLNSSALLORYVRVRYASTNLRLFVQNSNNDFLIVIYINKTMNK	540	XX
Db	481	CFLMQDRGTTIPFTWTHRSVDFPFTKVTLNSSALLORYVRVRYASTNLRLFVQNSNNDFLIVIYINKTMNK	540	XX
Qy	541	LFLKKESSNSIAKFKVTLNSSALLORYVRVRYASTNLRLFVQNSNNDFLIVIYINKTMNK	600	XX
Db	541	LFLKKESSNSIAKFKVTLNSSALLORYVRVRYASTNLRLFVQNSNNDFLIVIYINKTMNK	600	XX
Qy	601	DDDLITYQTFDPLATNSNSNGFGSKDNELIIGAESFSNEKYYIDKIEFIPVQL	652	XX
Db	601	DDDLITYQTFDPLATNSNSNGFGSKDNELIIGAESFSNEKYYIDKIEFIPVQL	652	XX
RESULT 40				
AAV23196				
ID	AAV23196	standard; protein: 652 AA.		
XX				
AC				
XX				
DT				
24-AUG-1999		(first entry)		
Amino acid sequence of Cry3Bb.11046 polypeptide.				
DE				
XX				
KW		Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; Diabrotica virgifera vergifera LeConte; insecticide resistance.		
XX				
OS		Synthetic.		
XX		Bacillus thuringiensis.		
PN	W09931248-A1.			
XX				
PD	24-JUN-1999.			
XX				
PF	17-DEC-1998;	98WO-US026852.		
XX				
PR	18-DEC-1997;	97US-00993170.		
PR	18-DEC-1997;	97US-00993722.		
PR	18-DEC-1997;	97US-00993775.		
PR	18-DEC-1997;	97US-00996441.		
XX				
PA	(ECOG- ) ECOGEN INC.			
PA	(MONS ) MONSANTO CO.			
XX				
PT	English L, Brussock SM, Malvar TM, Bryson JW, Kuleza CA,			
PS	Walters FS, Slatin SL, van Tersch MA, Romano C;			
XX				
WPI:	1999-395184/33.			
XX				
DR	Insecticidal Bacillus thuringiensis proteins.			
XX				
PT	Claim 39; Page 407-409; 512pp; English.			
PS				
XX				
CC	AAV23172-Y23206, and AAX23208-X23209 represent new Bacillus thuringiensis Cry3Bb mutant proteins. The specification also describes methods of altering Bacillus thuringiensis Cry3Bb. The B. thuringiensis Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-165 of the unmodified polypeptide sequence (AAV23207 represents the wild type Cry3Bb protein).			
CC	AAV23172 standard; protein: 652 AA.			
XX				
AC				
XX				
DT	24-AUG-1999 (first entry)			
XX				
DE	Amino acid sequence of Cry3Bb.11221 polypeptide.			
XX				
KW	Cry3Bb; mutant; insecticidal activity; insecticidal specificity; coleoptera; Southern corn rootworm; western corn root worm; Diabrotica undecimpunctata howardi Barber; transgenic plant; Diabrotica virgifera vergifera LeConte; insecticide resistance.			
XX				



CC application to the environment. It is especially useful against southern corn rootworm and western corn root worm, (Diabrotica undecimpunctata howardi Barber, and Diabrotica virgifera virgifera LeConte respectively). CC the mutant cry3Bb Polynucleotides can also be used to produce transgenic plants with increased insecticide resistance

XX Sequence 653 AA;

Query Match 99.1%; Score 3377; DB 2; Length 653; Best Local Similarity 99.4%; Pred. No. 2e-274; 1; Mismatches 3; Indels 0; Gaps 0;

Matches 64; Conservative 1; Gaps 0; Gaps 0;

Qy 2 NPNRSEHTDKTIVTPNSELQTNHQYPLADNPNSTLEELNYKEFLRMTEDSSTEVLNDST 61  
Db 3 NPNRSEHTDKTIVTPNSELQTNHQYPLADNPNSTLEELNYKEFLRMTEDSSTEVLNDST 62Qy 62 VDAVGTGSVVGQILGVGVPGALTSFYQSFNTIWPSDAPWKAQMAQVEVLIDK 121  
Db 63 VDAVGTGSVVGQILGVGVPGALTSFYQSFNTIWPSDAPWKAQMAQVEVLIDK 122Qy 122 TEEYAKSKALABLOGLQNNEFDYNNALNSWKTKPLSLRSKRSODIRELFSQAEHPRNS 181  
Db 123 IEEYAKSKALAELOGLQNNEFDYNNALNSWKTKPLSLRSKRSODIRELFSQAEHPRNS 182Qy 182 MPSFAVKSEPEVLFLPTYQDAQANTHLLIKDAQVEGEEGNSSEDAEYHRQLKLTQOYT 241  
Db 183 MPSFAVKSEPEVLFLPTYQDAQANTHLLIKDAQVEGEEGNSSEDAEYHRQLKLTQOYT 242Qy 242 DHCYWNWYNGVLNGLRGSTDAWVKNRFFREMTLTVLDLIVLPPFYDRLYSLKGVKTEL 301  
Db 243 DHCYWNWYNGVLNGLRGSTDAWVKNRFFREMTLTVLDLIVLPPFYDRLYSLKGVKTEL 302Qy 302 RDIFTDPIPLSLNTLQEYGPFTLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNYWS 361  
Db 303 RDIFTDPIPLTLQKGTFLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNTWS 362Qy 362 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 421  
Db 363 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 422Qy 422 TKVDFSQYDQKRTSTQYDTSKRNNGHVAQDSDQLPETTDEPLEKAYSHQNLVAC 481  
Db 423 TKVDFSQYDQKNTSTQYDTSKRNNGHVAQDSDQLPETTDEPLEKAYSHQNLVAC 482Qy 482 FLMQDRRGTIFFWTHRSVDFNTIDAEKIKITOLPVVKAIALSGASIEGRGFTGENL 541  
Db 483 FLMQDRRGTIFFWTHRSVDFNTIDAEKIKITOLPVVKAIALSGASIEGRGFTGNL 542Qy 542 FLKESNSNIAFKFVTLNSALLQRYVRITYASTNURLFVQNSNNDPLVITYINKTMKD 601  
Db 543 FLKESNSNIAFKFVTLNSALLQRYVRITYASTNURLFVQNSNNDPLVITYINKTMKD 602Qy 602 DDLTYQTPLATTNNMNGFSGDKNEELIIGAESFSNEKXIDKIEFIPVQL 652  
Db 603 DDLTYQTPLATTNNMNGFSGDKNEELIIGAESFSNEKXIDKIEFIPVQL 653Qy 653 REGUFTDPIPLSLNTLQEYGPFTLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNYWS 361  
Db 654 AAY70444 standard; Protein; 653 AA.XX AAY70444; 21-JUN-2000 (first entry)  
XX Bacillus thuringiensis delta-endotoxin Cry3Bb variant v11231.DB 778 delta-endotoxin; Cry3B; Bt toxin; crystal protein; insect pest; insecticide; Coleopteran; expression cassette; transgenic plant; Cry3Bb variant v11231.  
OS Bacillus thuringiensis. Synthetic.Qy 778 482 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 541  
Db 779 483 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 542Qy 858 362 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 421  
Db 859 363 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 422Qy 898 422 TKVDFSQYDQKNTSTQYDTSKRNNGHVAQDSDQLPETTDEPLEKAYSHQNLVAC 481  
Db 900 423 TKVDFSQYDQKNTSTQYDTSKRNNGHVAQDSDQLPETTDEPLEKAYSHQNLVAC 482Qy 938 462 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 541  
Db 939 483 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 542Qy 962 988 302 RDIFTDPIPLSLNTLQEYGPFTLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNTWS 361  
Db 963 303 RDIFTDPIPLTLQKGTFLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNTWS 362Qy 986 362 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 421  
Db 987 363 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 422Qy 1010 422 DHCYWNWYNGVLNGLRGSTDAWVKNRFFREMTLTVLDLIVLPPFYDRLYSLKGVKTEL 301  
Db 1011 423 DHCYWNWYNGVLNGLRGSTDAWVKNRFFREMTLTVLDLIVLPPFYDRLYSLKGVKTEL 302Qy 1030 462 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 541  
Db 1031 483 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 542Qy 1058 302 RDIFTDPIPLSLNTLQEYGPFTLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNTWS 361  
Db 1059 303 RDIFTDPIPLTLQKGTFLSENSIRKPHLFDYLOGIEFHTRLQPGYFGKDSFNTWS 362Qy 1088 362 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 421  
Db 1089 363 GNYVETRPSIGSSKTTSPYGDKSTEPIVQLSFDGQKVTYRANTDVAWPNKGKVYLG 422Qy 1112 422 DHCYWNWYNGVLNGLRGSTDAWVKNRFFREMTLTVLDLIVLPPFYDRLYSLKGVKTEL 301  
Db 1113 423 DHCYWNWYNGVLNGLRGSTDAWVKNRFFREMTLTVLDLIVLPPFYDRLYSLKGVKTEL 302Qy 1138 462 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 541  
Db 1139 483 FLMQDRRGTIFFWTHRSVDFNTIDAEKITOLPVVKAIALSGASIEGRGFTGNL 542

QY	542	ELKESSNSIAKPKVTIINSAALLQYRVRKASTNINRLFLVONSNNDELVITYINKTMKD	601	
QY	543	ELKESSNSIAKPKVTIINSAALLQYRVRKASTNINRLFLVONSNNDELVITYINKTMKD	602	
Db	602	DDLTQYTFDLATTSNMGSGDKNELLIGAESFVSNEKYYDKIEFIPVQL	652	
Db	603	DDLTQYTFDLATTSNMGSGDKNELLIGAESFVSNEKYYDKIEFIPVQL	653	
RESULT 44				
ID	ABU09195	standard; protein; 653 AA.		
XX				
AC	ABU09195;			
XX				
DT	12-JUN-2003	(First entry)		
XX				
DE	Bacillus thuringiensis	delta endotoxin	Cry3Bb1v11231.	
XX				
DE	Cry3Bb1v11231; delta-endotoxin; plant; transgenic; insecticide; crystal 3;			
KW	Coleopteran insect infestation; insecticide; crystal 3;			
KW	Cry3; Coleopteran insect infestation; increased toxicity; season long protection; beetle.			
KW				
XX				
OS	Bacillus thuringiensis.			
OS	Synthetic.			
XX				
PN	US6501009-B1.			
XX				
PD	31-DEC-2002.			
XX				
PF	19-AUG-1999;	99US-00377466.		
XX				
PR	19-AUG-1999;	99US-00377466.		
XX				
PA	(MONS ) MONSANTO TECHNOLOGY LLC.			
XX				
PI	Romano CP;			
XX				
XX	WPI; 2003-352192/33.			
DR	N-PSDB; ABX95182.			
XX				
PT	New modified polynucleotide useful for controlling Coleopteran insect infestation in a field of crop plants encodes insecticidal crystal 3			
PT	Bacillus thuringiensis delta-endotoxin.			
XX				
PS	Example 2; Col 73-78; 107PP; English.			
XX				
CC	The invention relates to a modified polynucleotide which encodes an insecticidal crystal 3 (Cry3). Bacillus thuringiensis delta-endotoxin such as CryBb1. The modified polynucleotide is useful for producing a transformed cell, by introducing the modified polynucleotide into a cell such as a plant cell (preferably a maize cell) or a microbial cell. The modified polynucleotide is useful for producing a transformed maize plant by introducing the modified polynucleotide into maize plant cell, selecting a transformed maize plant cell. A transgenic plant expressing the modified polynucleotide is useful for controlling Coleopteran insect infestation in a field of crop plants. The modified polynucleotide is useful for producing transgenic plants expressing higher levels of the insect controlling B. thuringiensis delta-endotoxin. The modified polynucleotide provides up to 10 fold higher levels of insect controlling delta-endotoxin relative to the highest levels obtained using prior compositions. In particular, transgenic maize expressing higher levels of the Cry3Bb1 protein designed to exhibit increased toxicity toward Coleopteran pests deliver superior levels of insect protection and are less likely to sponsor development of populations of target insects that are resistant to the insecticidally active protein. Improved control of susceptible target insect pests and season long protection from insect pathogens is achieved using the modified polynucleotide. The modified polynucleotide reduces the number of transgenic events that have to be screened in order to identify one which contains beneficial levels of one or more insect controlling compositions. The present sequence represents the amino acid sequence of Bacillus thuringiensis delta endotoxin	RESULT 45		
CC		ABU09198 standard; protein; 653 AA.		
XX				
AC	ABU09198;			
XX				
DT	12-JUN-2003	(First entry)		
XX				
DB	Bacillus thuringiensis delta endotoxin Cry3Bb1v11231.			
XX				
KW	Cry3Bb1v11231; delta-endotoxin; plant; transgenic; insecticide; crystal 3; Cry3; Coleopteran insect infestation; increased toxicity;			
KW				
XX				
OS	Bacillus thuringiensis.			
OS	Synthetic.			
XX				
PN	US6501009-B1.			
XX				
PD	31-DEC-2002.			

XX	19-AUG-1999;	99US-00377466.	Db	303 RDIFTDPFLFLTTLQKYGPTFLSIENSIRKPHLFDFLQGIEPHTRLQPGYFGRKDSFNYWS	362
XX	19-AUG-1999;	99US-00377466.	Qy	362 GNYVETRPSIGSSKTTISPPFYGDKSTEPVQLSFDGQKVYRTANTDVAAPNGKVYLG	421
XX	(MONS ) MONSANTO TECHNOLOGY LLC.		Db	363 GNYVETRPSIGSSKTTISPPFYGDKSTEPVQLSFDGQKVYRTANTDVAAPNGKVYLG	422
XX	Romano CP;		Qy	422 TRVDFSQYDQNETSQTQYDSKRNGHVSQDSIDQLPETTDEPLEKAYSHOLNVAEC	481
XX	WPI: 2003-352192/33.		Db	423 TRVDFSQYDQNETSQTQYDSKRNGHVSQDSIDQLPETTDEPLEKAYSHOLNVAEC	482
DR	ABX95185, ABX95186, ABX95200.		Qy	482 FLNQDRRTIPFPTWHRSDVDFNTDAEKITQLPVYKAYALSSGASIEGPGFTGNLL	541
DR	ABX95185,		Db	483 FLNQDRRTIPFPTWHRSDVDFNTDAEKITQLPVYKAYALSSGASIEGPGFTGNLL	542
PT	New modified polynucleotide useful for controlling Coleopteran insect infestation in a field of crop plants encodes insecticidal crystal Bacillus thuringiensis delta-endotoxin.		Qy	542 FLKESNSIAKEPKVTLNSAALLQYRVRIVASTNRLFVQNSNDFLVYTKNTKMKD	601
PT	PT		Db	543 FLKESNSIAKEPKVTLNSAALLQYRVRIVASTNRLFVQNSNDFLVYTKNTKMKD	602
PT	PT		Qy	602 DDITYQFDLATTNSNMGFSGDKNELLIGAESFVNNEKIVYDKEFIPVQL	652
XX	Disclosure; Col 101-104; 107pp; English.		Db	603 DDITYQFDLATTNSNMGFSGDKNELLIGAESFVNNEKIVYDKEFIPVQL	653
XX					
CC	The invention relates to a modified polynucleotide which encodes an insecticidal crystal 3 (Cry3) Bacillus thuringiensis delta-endotoxin such as Cry3b. The modified polynucleotide is useful for producing a transformed cell, by introducing the modified polynucleotide into a cell such as a plant cell (preferably a maize cell) or a microbial cell. The modified polynucleotide is useful for producing a transformed maize plant by introducing the modified polynucleotide into a maize plant cell, selecting a transformed maize plant cell and regenerating the maize plant from the transformed maize plant cell. A transgenic plant expressing the modified polynucleotide is useful for controlling Coleopteran insect infestation in a field of crop plants. The modified polynucleotide is useful for producing transgenic plants expressing higher levels of the insect controlling B. thuringiensis delta-endotoxin. The modified polynucleotide provides up to 10 fold higher levels of insect controlling delta-endotoxin relative to the highest levels obtained using prior compositions. In particular, transgenic maize expressing higher levels of the Cry3Bb protein designed to exhibit increased toxicity toward Coleopteran pests deliver superior levels of insect protection and are less likely to sponsor development of populations of target insects that are resistant to the insecticidally active protein. Improved control of susceptible target insect pests and season long protection from insect pathogens is achieved using the modified polynucleotide. The modified polynucleotide reduces the number of transgenic events that have to be screened in order to identify one which contains beneficial levels of one or more insect controlling compositions. The present sequence represents the amino acid sequence of Bacillus thuringiensis delta endotoxin Cry3Bb1v1231.		RESULT 46		
CC			ABW01053	ABW01053 standard; protein; 653 AA.	
CC			XX	ABW01053;	
CC			XX	AC	
CC			XX	DT 15-JAN-2004 (first entry)	
CC			XX	DE Bacillus thuringiensis Cry3Bb-delta-endotoxin variant v11231 protein.	
CC			XX	KW Transgenic plant; Cry3Bb-delta-endotoxin; Coleopteran pest resistance; insecticide; variant.	
CC			XX	XX Bacillus thuringiensis.	
CC			XX	OS Synthetic.	
CC			XX	OS Bacillus thuringiensis.	
CC			XX	XX US2003115630-A1.	
CC			XX	PN	
CC			XX	PD 19-JUN-2003.	
CC			XX	XX 29-AUG-2002; 20002US-00232665.	
CC			XX	PF 29-AUG-2002; 20002US-00232665.	
CC			XX	XX 19-AUG-1999; 99US-00377466.	
CC			XX	XX (ROMA/ ) ROMANO C P.	
CC			XX	PA	
CC			XX	PI Romano CP;	
CC			XX	XX WPI; 2003-910928/76.	
CC			XX	DR N-PSDB; AAD61786, AAD61789, AAD61790, AAD61803, AAD61804.	
CC			XX	PT New transgenic plant resistant to Coleopteran pests, comprises Bacillus thuringiensis Cry3-delta-endotoxin gene.	
CC			XX	PT Sequence 653 AA;	
CC			XX	PS Claim 6; Page 40-42; 0pp; English.	
CC			XX	XX The invention relates to novel transgenic plants comprising Bacillus thuringiensis Cry3-delta-endotoxin gene or its variants having coleopteran inhibitory activity. The invention is useful for controlling Coleopteran insect infestation in a field of crop plants. The present sequence is B. thuringiensis Cry3Bb-delta-endotoxin variant protein.	
CC			XX	XX Sequence 653 AA;	
CC			XX	Query Match 99.1%; Score 3377; DB 7; Length 653;	
CC			XX	Best Local Similarity 99.4%; Pred. No. 2e-274; Indels 0; Gaps 0;	
CC			XX	Matches 647; Conservative 1; Mismatches 3;	
Qy	2 NPNRSEHDITKYPNSELQTNHNOYPLADNPNSTLEFLNYKEFLRMTEDSSTEVLNST	61	Qy	2 NPNRSEHDITKYPNSELQTNHNOYPLADNPNSTLEFLNYKEFLRMTEDSSTEVLNST	61
Db	3 NPNRSEHDITKYPNSELQTNHNOYPLADNPNSTLEFLNYKEFLRMTEDSSTEVLNST	62	Db	3 NPNRSEHDITKYPNSELQTNHNOYPLADNPNSTLEFLNYKEFLRMTEDSSTEVLNST	62
Qy	62 VDQAVGTGTSVQILGVGVPPAGALTFSYQSFPLNTIWPSPDWPWKAQVEVLDK	121	Qy	62 VDQAVGTGTSVQILGVGVPPAGALTFSYQSFPLNTIWPSPDWPWKAQVEVLDK	121
Db	63 VRDAVGTGTSVQILGVGVPPAGALTFSYQSFPLNTIWPSPDWPWKAQVEVLDK	122	Db	63 VRDAVGTGTSVQILGVGVPPAGALTFSYQSFPLNTIWPSPDWPWKAQVEVLDK	122
Qy	122 IEEYAKSKALAEQGLQNNFEDYNAIWSKKTPLSLRSKSDRTRELFSQAESHFRNS	181	Qy	122 IEEYAKSKALAEQGLQNNFEDYNAIWSKKTPLSLRSKSDRTRELFSQAESHFRNS	181
Db	123 IEEYAKSKALAEQGLQNNFEDYNAIWSKKTPLSLRSKSDRTRELFSQAESHFRNS	182	Db	123 IEEYAKSKALAEQGLQNNFEDYNAIWSKKTPLSLRSKSDRTRELFSQAESHFRNS	182
Qy	182 MPSFAVSKKEVLPLTPYQAQANTHLLKDAQYFGEENGSSVEDVARFYHQLKLTQOYT	241	Qy	182 MPSFAVSKKEVLPLTPYQAQANTHLLKDAQYFGEENGSSVEDVARFYHQLKLTQOYT	241
Db	183 MPSFAVSKKEVLPLTPYQAQANTHLLKDAQYFGEENGSSVEDVARFYHQLKLTQOYT	242	Db	183 MPSFAVSKKEVLPLTPYQAQANTHLLKDAQYFGEENGSSVEDVARFYHQLKLTQOYT	242
Qy	242 DHCYNTWVNGLNGLRSYDAWVKNPREMTLTVLIVPPFYDIRLKSKGVKTBLT	301	Qy	242 DHCYNTWVNGLNGLRSYDAWVKNPREMTLTVLIVPPFYDIRLKSKGVKTBLT	301
Db	243 DHCYNTWVNGLNGLRSYDAWVKNPREMTLTVLIVPPFYDIRLKSKGVKTBLT	302	Db	243 DHCYNTWVNGLNGLRSYDAWVKNPREMTLTVLIVPPFYDIRLKSKGVKTBLT	302
Qy	302 RDIFTDPFLSLNTLQEXGPTFLSIENSIRKPHLFDFLQGIEPHTRLQPGYFGRKDSFNYWS	361	Qy	302 RDIFTDPFLSLNTLQEXGPTFLSIENSIRKPHLFDFLQGIEPHTRLQPGYFGRKDSFNYWS	361

Db	3	NPNNRSHDTIKVTPNSBLCNTHNOQPLADNPNSTLEBLNKFRLPTEDESSTEVLDSNT	62	PA (ECOG-) ECOGEN INC. (MONS ) MONSANTO CO.
Qy	62	VKDAVGIGISVVGQIQLGVGPAGALTSPYQFLNTIWPSDADPKAFMAQVEVLIDRK	121	English L, Brusock SM, Malvar TM, Bryson JW, Kulesza CA;
Db	63	VKDAVGIGISVVGQIQLGVGPAGALTSPYQFLNTIWPSDADPKAFMAQVEVLIDRK	122	Walters FS, Slatin SL, Von Tersch MA, Romano C;
Qy	122	IEYAKSKALAKLPLQIQLQNNFEDYVNAIWNWKTKPLSLRSKRSQDRIRELFSQAESFRNS	181	WPI; 1999-395184/33.
Db	123	IEYAKSKALAKLPLQIQLQNNFEDYVNAIWNWKTKPLSLRSKRSQDRIRELFSQAESFRNS	182	XX PT Insecticidal <i>Bacillus thuringiensis</i> proteins.
Ps				XX
Qy	182	MPSFAVKFEVLFLPLTYAQAAANTHLLKKDAQVGEWGSSEDVAFYHQLKTQQT	241	Claim 39; Page 492-494; 512pp; English.
Db	183	MPSFAVKFEVLFLPLTYAQAAANTHLLKKDAQVGEWGSSEDVAFYHQLKTQQT	242	XX AAY2172-Y23206, and AAY23208-X23209 represent new <i>Bacillus thuringiensis</i> Cry3Bb mutant proteins. The specification represents methods of altering <i>Bacillus thuringiensis</i> Cry3Bb. The <i>B. thuringiensis</i> Cry3Bb polypeptide was modified to have improved insecticidal activity or enhanced insecticidal specificity against a target insect. The modification comprises at least one amino acid substitution, addition, or deletion in the primary sequence of the native or unmodified Cry3Bb polypeptide, wherein the substitution or deletion occurs at a position corresponding to from about amino acids 1-355 of the unmodified polypeptide sequence (AAY23207 represents the wild type Cry3Bb protein). The polypeptide can be used to kill coleopteran pests, especially by application to the environment. It is especially useful against southern corn rootworm and western corn root worm, ( <i>Diabrotica undecimpunctata</i> howardi Barber, and <i>Diabrotica virgifera virgifera</i> LeConte respectively). The mutant Cry3Bb polypeptides can also be used to produce transgenic plants with increased insecticide resistance
Qy	242	DHCVNWNVNGLNGRLSTYDAWVKENFRFREMTLTVLILVLPFPFDIYLQSKGVKTELT	301	XX
Db	243	DHCVNWNVNGLNGRLSTYDAWVKENFRFREMTLTVLILVLPFPFDIYLQSKGVKTELT	302	CC
Qy	302	RDIFTDPIFSINTLQEQYGPTEFLSIENSIRKPHLFYDLYQGTEFHTRLQPGFQGDNSFNYWS	361	CC
Db	303	RDIFTDPIFLTLTQKQGPFLSIENSIRKPHLFYDLYQGTEFHTRLQPGFQGDNSFNYWS	362	CC
Qy	362	GNYVETRPSIGSSKTTISPFYQDKSTEPVKQLSFDGQKVKVRLTANTDVAAPNGKVLGV	421	CC
Db	363	GNYVETRPSIGSSKTTISPFYQDKSTEPVKQLSFDGQKVKVRLTANTDVAAPNGKVLGV	422	CC
Qy	422	TKVDFSYDDQKNETSTOTYDSKRNCHGVAQDSDQDLPPTTDEPLEKAYSHOLNYAEC	481	CC
Db	423	TKVDFSYDDQKNETSTOTYDSKRNCHGVAQDSDQDLPPTTDEPLEKAYSHOLNYAEC	482	CC
Qy	482	FLMQDRGTTIPPTWTHRSVPDFENTIDAEEKITQLPVVKAYAISGASIIBPGFPGNLL	541	CC
Db	483	FLMQDRGTTIPPTWTHRSVPDFENTIDAEEKITQLPVVKAYAISGASIIBPGFPGNLL	542	CC
Qy	542	FLKESSNSIAKEPKVTLNSAALLQRYVRVRYIYSTTINLRLFYQNSNNDFLVYINKTMNKKD	601	Qy 1 MNPNNRSEHDTIKVTPNSBLCNTHNOQPLADNPNSTLEBLNKFRLPTEDESSTEVLDSNT
Db	543	FLKESSNSIAKEPKVTLNSAALLQRYVRVRYIYSTTINLRLFYQNSNNDFLVYINKTMNKKD	602	60 CC
Qy	602	DDLTXQTFDATTNSNNMGFSDKNEELIGAASFVSNKEVYDKEBIPVQL	652	Qy 1 MNPNNRSEHDTIKVTPNSBLCNTHNOQPLADNPNSTLEBLNKFRLPTEDESSTEVLDSNT
Db	603	DDLTXQTFDATTNSNNMGFSDKNEELIGAASFVSNKEVYDKEBIPVQL	653	60 CC
RESLT 47				Qy 121 KIEEYAKSKALAELOGLQNNEFVNLSNWKKTBLISLRSKRSQDRIRELFSQAESFRN 180
ID	AY23209	standard; protein; 652 AA.		Db 121 KIEEYAKSKALAELOGLQNNEFVNLSNWKKTBLISLRSKRSQDRIRELFSQAESFRN 180
AC	AY23209;			Qy 181 SMPSPAVSKPEVLFLPTYAQANTHLLKKDAOVFGENGYSSEDVAEFYHTRQLKLTQOY 240
XX				Db 181 SMPSPAVSKPEVLFLPTYAQANTHLLKKDAQVFGEEWGSSEDVAEFYHTRQLKLTQOY 240
DT	24-AUG-1999	(first entry)		Qy 241 TDHCVNWNVNGLNGRLSTYDAWVKENFRFREMTLTVLILVLPFPFDIYLQSKGVKTEL 300
XX				Db 241 TDHCVNWNVNGLNGRLSTYDAWVKENFRFREMTLTVLILVLPFPFDIYLQSKGVKTEL 300
DE				Qy 301 TRDIFTDPISLNTLQEQYGPFLSIENSIRKPHLFYDLYQGTEFHTRLQPGFQGDNSFNYW 360
XX				Db 301 TRDIFTDPISLNTLQEQYGPFLSIENSIRKPHLFYDLYQGTEFHTRLQPGFQGDNSFNYW 360
CW				Qy 361 SGNYVETRPSIGSSKTTISPFYQDKSTEPVKQLSFDGQKVKVRLTANTDVAAPNGKVLGV 420
KW				Db 361 SGNYVETRPSIGSSKTTISPFYQDKSTEPVKQLSFDGQKVKVRLTANTDVAAPNGKVLGV 420
KW				Qy 421 VTKYDFSYDDQKNETSTOTYDSKRNCHGVAQDSDQDLPPTTDEPLEKAYSHOLNYAE 480
KW				Db 421 VTKYDFSYDDQKNETSTOTYDSKRNCHGVAQDSDQDLPPTTDEPLEKAYSHOLNYAE 480
XX				Qy 481 CPMQDRGTRGTPPFTWTHRSVPDFENTIDAEEKITQLPVVKAYAISGASIIBPGFPGNLL 540
PR	18-DEC-1997;	97US-00993170.		Db 481 CPMQDRGTRGTPPFTWTHRSVPDFENTIDAEEKITQLPVVKAYAISGASIIBPGFPGNLL 540
PR	18-DEC-1997;	97US-00993775.		Qy 541 LFLKESSNSIAKEPKVTLNSAALLQRYVRVRYIYSTTINLRLFYQNSNNDFLVYINKTMNK 600
PR	18-DEC-1997;	97US-00996441.		XX

Db	541 LFLKESSNSIAKFKVTLNSAALLORYRVRIRYASTTNLFLVQNSNNDFLVIVINKTMNK 600	Db	183 MPSFAVSKEVLFPLPTYQAQANTHLLKDAQVFGEEENGSSDAEFTYRQLKLTKQYT 242
Qy	601 DDDLYTQTFDLATTSNSNMGSFDKNEEL11GAESFSNEK1Y1DK1KF1PVOL 652	Qy	242 DHCYWNWNTVNGLCLRGSTYDANVKFRFREMTLVLIVLFPYDRLYSCKVKTLET 301
Db	601 DDDLYTQTFDLATTSNSNMGSFDKNEEL11GAESFSNEK1Y1DK1KF1PVOL 652	Db	243 DHCYWNWNTVNGLCLRGSTYDANVKFRFREMTLVLIVLFPYDRLYSCKVKTLET 302
	RESULT 48		
AAV70446			
ID	AAV70446 standard; protein; 653 AA.	Db	302 RDIFTDPFLSLNLQEQYOPTFNSIERSRKPHFLDFLOGIEFHTRLQPGYFGKDSFNYWS 361
XX		Db	303 RDIFTDPFLSLNLQPGYFGKDSFNYWS 362
AC		Qy	362 GNYVETRPSIGSSKTTSPPFYGDKSTEPVQKLSFDGOKVYRTANTDVAAPNGKVVLYG 421
XX		Db	363 GNYVETRPSIGSSKTTSPPFYGDKSTEPVQKLSFDGOKVYRTANTDVAAPNGKVVLYG 422
DT	21-JUN-2000 (first entry)	Qy	422 TKYDFSQYDDQNETSTQYDSKRNGHIVSAQDSIDQLPPTTDEPLKAYSHOLNTAEC 481
XX		Db	423 TKYDFSQYDDQNETSTQYDSKRNGHIVSAQDSIDQLPPTTDEPLKAYSHOLNTAEC 482
DE	Bacillus thuringiensis delta-endotoxin Cry3Bb variant 11231mv2.	Qy	482 FLMQDRRGTTIPFTWHSVDFNTDAEKITQLPVKAUSSGASIEGPOFTGNLL 541
XX		Db	483 FLMQDRRGTTIPFTWHSVDFNTDAEKITQLPVKAUSSGASIEGPOFTGNLL 542
KW	delta-endotoxin; Cry3B; Bt toxin; crystal protein; insect pest; insecticide; Coleopteran; expression cassette; transgenic plant; Cry3Bb variant 11231mv2.	Qy	542 FLKESNSNIAKFKVTLNSAALLORYRVRIRYASTTNLFLVQNSNNDFLVIVINKTMNKD 601
KW		Db	543 FLKESNSNIAKFKVTLNSAALLORYRVRIRYASTTNLFLVQNSNNDFLVIVINKTMNKD 602
OS	Bacillus thuringiensis.	Qy	602 DDITYQTFDLATTSNMGPSGDNEEL1GAESFSVNEK1Y1DK1F1PVQL 652
OS	Synthetec.	Db	603 DDITYQTFDLATTSNMGPSGDNEEL1GAESFSVNEK1Y1DK1F1PVQL 653
PA			
PA	02-MAR-2000.		RESULT 49
XX	XX	ABU09197	
XX	19-AUG-1.999;	ID	ABU09197 standard; protein; 653 AA.
XX	9910-US018882.	XX	
XX	19-AUG-1.998;	AC	ABU09197;
PR	98US-0097150P.	XX	
XX		DT	12-JUN-2003 (first entry)
PA	(MONS ) MONSANTO CO.	XX	Bacillus thuringiensis delta endotoxin Cry3Bb 11231mv2.
XX	Ronano CP;	XX	Cry3Bb 11231mv2; delta-endotoxin; plant; transgenic; insecticide; crystal 3; Cry3; Coleopteran insect infestation; increased toxicity; season long protection; beetle.
XX	WPT: 2000-246568/21.	XX	Bacillus thuringiensis.
DR	DR-N-PSDB; AAZ51640, AAZ51645, AAZ51646.	XX	Synthetic.
XX		XX	
PT	Novel expression cassettes which express Bacillus thuringiensis Cry3 delta-endotoxin portion which is toxic to coleopteran insect pests, useful for producing transgenic plants with improved insecticidal activity.	XX	US6501009-B1.
PT		XX	
PT	Claim 6: Page 116-118; 171pp; English.	PD	31-DEC-2002.
PS	XX	XX	
CC	The present sequence is a Bacillus thuringiensis delta-endotoxin Cry3Bb variant 11231mv2 which is toxic to Coleopteran insect pests. The coding sequence of this protein is used in an expression cassette that provides improved expression of Cry3B or Cry3B variant proteins in transgenic plants e.g. maize. Transgenic plants expressing higher levels of Cry3B proteins exhibit increased insecticidal activity against Coleopteran pests	XX	PP 19-AUG-1999;
CC	XX	XX	99US-00377466.
CC		PR 19-AUG-1999;	99US-00377466.
CC		XX	
SQ	Sequence 653 AA;	XX	
CC	Query Match 99.0%; Score 3373; DB 3; Length 653;	PA (MONS ) MONSANTO TECHNOLOGY LLC.	
CC	Best Local Similarity 99.2%; Pred. No. 4, 4e-27;	PA	
CC	Matches 646; Conservative 2; Mismatches 3; Indels 0; Gaps 0;	XX	
Qy	2 NPNRSEHTIKTVPNSLQTNHNOYPLADNPNSTLLEENYKEFLRMTDSDSSTEVLNST 61	PI	
Db	3 NPNRSEHTIKTVPNSLQTNHNOYPLADNPNSTLLEENYKEFLRMTDSDSSTEVLNST 62	XX	
Qy	62 VKDAGVTGIVSVQGILGVGPAGALTSFYQSPLNTIWPSPDAPWKAQAEVFLDK 121	XX	
Db	63 VKDAGVTGIVSVQGILGVGPAGALTSFYQSPLNTIWPSPDAPWKAQAEVFLDK 122	DR	WPI; 2003-352192/33.
Qy	122 IEEYAKSKKALAEQGLQNNFEDYNA1NSWKCP1PLSLRSKRSODIRELFSQAEASHFRNS 181	PR	PT infestation in a field of crop plants encodes insecticidal crystal 3.
Db	123 IEEYAKSKKALAEQGLQNNFEDYNA1NSWKCP1PLSLRSKRSODIRELFSQAEASHFRNS 182	PR	PT Bacillus thuringiensis delta-endotoxin.
Qy	182 MPSFAVSKEVLFPLPTYQAQANTHLLKDAQVFGEEENGSSDAEFTYRQLKLTKQYT 241	XX	XX Disclosure; Fig 6; 107pp; English.

transformed cell, by introducing the modified polynucleotide into a cell such as a plant cell (preferably a maize cell) or a microbial cell. The modified polynucleotide is useful for producing a transformed maize plant by introducing the modified polynucleotide into a maize plant cell, selecting a transformed maize plant cell and regenerating a maize plant from the transformed maize plant cell. A transgenic plant expressing the modified polynucleotide is useful for controlling Coleopteran insect infestation in a field of crop plants. The modified polynucleotide is useful for producing transgenic plants expressing higher levels of the insect controlling B. thuringiensis delta-endotoxin. The modified polynucleotide provides up to 10 fold higher levels of insect controlling delta-endotoxin relative to the highest levels obtained using prior compositions. In particular, transgenic maize expressing higher levels of the Cry3Bb protein designed to exhibit increased toxicity toward Coleopteran pests deliver superior levels of insect protection and are less likely to sponsor development of populations of target insects that are resistant to the insecticidally active protein. Improved control of susceptible target insect pests and season long protection from insect pathogens is achieved using the modified polynucleotide. The modified polynucleotide reduces the number of transgenic events that have to be screened in order to identify one which contains beneficial levels of one or more insect controlling compositions. The present sequence represents the amino acid sequence of Bacillus thuringiensis delta endotoxin Cry3Bb 11231mv2.

Sequence 653 AA;

Query Match 99.0%; Score 3373; DB 6; Length 653;  
Best Local Similarity 99.2%; Pred. No. 4.4e-274;  
Matches 646; Conservative 2; Mismatches 3; Indels 0; Gaps 0;

Qy 2 NPNNRSBHDITKVTNPNSBLOTNHNOPLADNPNSTLLELYKEFLMTEDSSTEVLDSNT 61  
Db 3 NPNNRSBHDITKVTNPNSBLOTNHNOPLADNPNSTLLELYKEFLMTEDSSTEVLDSNT 62  
Qy 62 VDAVGTGSIISVYQGILGVGVGPAGALTTSFYOSFLNTIWPNSDADPMKAQMVEVLIDK 121  
Db 63 VDAVGTGSIISVWQIISVGVGPAGALTTSFYOSFLNTIWPNSDADPMKAQMVEVLIDK 122  
Qy 122 IEEYAKSKALAELQGLQNNFEDYVNAIWSWKTPLSRSRSQDRRELLPQAEHSFRNS 181  
Db 123 IEEYAKSKALAELQGLQNNFEDYVNAIWSWKTPLSRSRSQDRRELLPQAEHSFRNS 182  
Qy 182 MFSFAYSKEVLFPLPTIAQANTHLLKKDAQVFGEWGKSYSEDVAEFTYRQLKUTQQT 241  
Db 183 MFSFAYSKEVLFPLPTIAQANTHLLKKDAQVFGEWGKSYSEDVAEFTYRQLKUTQQT 242  
Qy 242 DHCVNWVNVGNGLGRGSTDYAVWKFNRFRENTLTIVLDLIVLFPFYDIRLYSKGVKTEL 301  
Db 243 DHCVNWVNVGNGLGRGSTDYAVWKFNRFRENTLTIVLDLIVLFPFYDIRLYSKGVKTEL 302  
Qy 302 RDIFTDPIFSNLQOEGYGPTELSIENSIRKPHLFYDVLQIGIEFTHRLQPGFQGKDSNWN 361  
Db 303 RDIFTDPIFSNLQOEGYGPTELSIENSIRKPHLFYDVLQIGIEFTHRLQPGFQGKDSNWN 362  
Qy 362 GNYVETRPSIGSSKTTISPFKGDKSTEPVQKLSFDGOKVYRTIANTDVAAMPNGKVLYG 421  
Db 363 GNYVETRPSIGSSKTTISPFKGDKSTEPVQKLSFDGOKVYRTIANTDVAAMPNGKVLYG 422  
Qy 422 TKVDFSOYDDQNETSTQTYDSKRNNGHVSAQSDIDLPETTDEPLEKAYSHQLYNAEC 481  
Db 423 TKVDFSOYDDQNETSTQTYDSKRNNGHVSAQSDIDLPETTDEPLEKAYSHQLYNAEC 482  
Qy 482 FLMQDRGTTIPFPTWTHRSVDFENTIDAEKTLQPLVYKAVALSSGASITIOPGFTGQNL 541  
Db 483 FLMQDRGTTIPFPTWTHRSVDFENTIDAEKTLQPLVYKAVALSSGASITIOPGFTGQNL 542  
Qy 542 FLKESSNSIAKEFKVTLNSAALLQYRVRVYASTTNRLPYQNSNDFLYINTKMKD 601  
Db 543 FLKESSNSIAKEFKVTLNSAALLQYRVRVYASTTNRLPYQNSNDFLYINTKMKD 602  
Qy 602 DDLTYQTFDLATNSNNGFSGDKNEELIGASFSVNEKIVYDKEFIPVQL 652

Db 603 DDLTYQTFDLATNSNNGFSGDKNEELIGASFSVNEKIVYDKEFIPVQL 653  
RESULT 50  
ABU05202 ID ABU05202 standard; protein; 653 AA.  
XX  
AC ABU05202;  
XX DT 12-JUN-2003 (first entry)  
XX Bacillus thuringiensis delta endotoxin Cry3Bb1 11231mv2.  
XX KW Cry3Bb1 11231mv2; delta-endotoxin; plant; transgenic; insecticide;  
XX KW crystal 3; Cry3; Coleopteran insect infestation; increased toxicity;  
XX KW season long protection; beetle.  
XX OS Bacillus thuringiensis.  
OS Synthetic.  
XX PN US6501009-B1.  
XX PR 19-AUG-1999; 99US-00377466.  
XX DR N-PSB; ABX95189, ABX95190.  
XX PT New modified polynucleotide useful for controlling Coleopteran insect infestation in a field of crop plants encodes insecticidal crystal 3 Bacillus thuringiensis delta-endotoxin.  
XX PS Disclosure; Col 139-142; 107PP; English.  
XX CC The invention relates to a modified polynucleotide which encodes an insecticidal crystal 3 (Cry3). Bacillus thuringiensis delta-endotoxin such as Cry3Bb. The modified polynucleotide is useful for producing a transformed cell, by introducing the modified polynucleotide into a cell such as a plant cell (preferably a maize cell) or a microbial cell. The modified polynucleotide is useful for producing a transformed maize plant by introducing the modified polynucleotide into a maize plant cell, selecting a transformed maize plant cell and regenerating a maize plant from the transformed maize plant cell. A transgenic plant expressing the modified polynucleotide is useful for controlling Coleopteran insect infestation in a field of crop plants. The modified polynucleotide is useful for producing transgenic plants expressing higher levels of the insect controlling B. thuringiensis delta-endotoxin. The modified polynucleotide provides up to 10 fold higher levels of insect controlling compositions. In particular, transgenic maize expressing higher levels of the Cry3Bb protein designed to exhibit increased toxicity toward Coleopteran pests deliver superior levels of insect protection and are less likely to sponsor development of populations of target insects that are resistant to the insecticidally active protein. Improved control of susceptible target insect pests and season long protection from insect pathogens is achieved using the modified polynucleotide. The modified polynucleotide reduces the number of transgenic events that have to be screened in order to identify one which contains beneficial levels of one or more insect controlling compositions. The present sequence represents the amino acid sequence of Bacillus thuringiensis delta endotoxin Cry3Bb1 11231mv2.  
XX SQ Sequence 653 AA;

Query Match 99.0%; Score 3373; DB 6; Length 653;  
Best Local Similarity 99.2%; Pred. No. 4.4e-274;

Matches	646	Conservative	2	Mismatches	3	Indels	0	Gaps	0
Qy	2	NNNRSEHTIKVTPNSELOTNHNQYPLADNPNSTLLEBNYKEPLRMTDSSTEVLNST	61						
Db	3	NNNRSEHTIKVTPNSELOTNHNQYPLADNPNSTLLEBNYKEPLRMTDSSTEVLNST	62						
Qy	62	VKDAVGTGSIVVGQTLGVNVPAGALTSFYQSLNTIMPSADPWKAEMAQEVLDKX	121						
Db	63	VKDAVGTGSIVVGQTLGVNVPAGALTSFYQSLNTIMPSADPWKAEMAQEVLDKX	122						
Qy	122	IEEAKSKALAEGLQNLNPFEDYNALNWKCPPLSLRKSDRIFLSQASHFRNS	181						
Db	123	IEEAKSKALAEGLQNLNPFEDYNALNWKCPPLSLRKSDRIFLSQASHFRNS	182						
Qy	182	MPSFAVSKFEVLFLPFTYQDAANTHLLLKDADYEVGEENYSSEDVAEFTYHROKLTOOT	241						
Db	183	MPSFAVSKFEVLFLPFTYQDAANTHLLLKDADYEVGEENYSSEDVAEFTYHROKLTOOT	242						
Qy	242	DHCYNNWYNTGLNGLRGSTDYAWKFNFRFREMLTIVLDLIVLFFPYDRLYSKGVKTEL	301						
Db	243	DHCYNNWYNTGLNGLRGSTDYAWKFNFRFREMLTIVLDLIVLFFPYDRLYSKGVKTEL	302						
Qy	302	RDIFDPITSLNTQBYGTPFLSENSIRKPHLEPDYLOGIEFHTRLQGYFGDSENYWS	361						
Db	303	RDIFDPITSLNTQBYGTPFLSENSIRKPHLEPDYLOGIEFHTRLQGYFGDSENYWS	362						
Qy	362	GNYVETRPSIGSSKTKTSPYGDKSTPQKLSDGQKVRYTANTDVAWPNGKVKLGV	421						
Db	363	GNYVETRPSIGSSKTKTSPYGDKSTPQKLSDGQKVRYTANTDVAWPNGKVKLGV	422						
Qy	422	TKVDFSQYDQKNETSTQYDTSKRNGHVAQDSDIDOLPETTDEPLEKAYSHOLNAYAC	481						
Db	423	TKVDFSQYDQKNETSTQYDTSKRNGHVAQDSDIDOLPETTDEPLEKAYSHOLNAYAC	482						
Qy	482	FLMDQRGTTIPFTWTHRYDPENTIDAKITIOLPVVKAVALSSGASIEGPFITGNNL	541						
Db	483	FLMDQRGTTIPFTWTHRYDPENTIDAKITIOLPVVKAVALSSGASIEGPFITGNNL	542						
Qy	542	FLKESSNSIAKFKVTLNSAALLQRYVRVRYASTTNLFLVQNSNNDFLVIVINKTMNKD	601						
Db	543	FLKESSNSIAKFKVTLNSAALLQRYVRVRYASTTNLFLVQNSNNDFLVIVINKTMNKD	602						
Qy	602	DDLTQTFDLATNNMGMGSGDKNELIGAESFSNEKYIDKIEFIPVQL	652						
Db	603	DDLTQTFDLATNNMGMGSGDKNELIGAESFSNEKYIDKIEFIPVQL	653						

Search completed: February 14, 2005, 15:20:09  
 Job time : 181 Secs

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